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# **THE TWENTIETH YEARBOOK**

**OF THE  
NATIONAL SOCIETY FOR THE STUDY  
OF EDUCATION**

**PART II  
REPORT OF THE SOCIETY'S COMMITTEE ON  
SILENT READING**

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**YEARBOOK WILL BE DISCUSSED AT THE ATLANTIC CITY  
MEETING OF THE NATIONAL SOCIETY SATURDAY,  
FEBRUARY 26, 1921 8-00 P M**

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**PUBLIC SCHOOL PUBLISHING COMPANY  
BLOOMINGTON ILLINOIS  
1921**

# THE TWENTIETH YEARBOOK

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NATIONAL SOCIETY FOR THE STUDY  
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## PART II REPORT OF THE SOCIETY'S COMMITTEE ON SILENT READING

Prepared by the Committee from Material Submitted  
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REPRESENTATIVES OF THE SCHOOL SYSTEMS OF CEDAR RAPIDS,  
DENVER, IOWA CITY, AND RACINE

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*Edited by* GUY MONTROSE WHIPPLE

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## INTRODUCTION

As stated in the introduction to the *Eighteenth Yearbook, Part II*, of this Society, it was hoped by those who contributed that the book would serve to stimulate further investigation in the various fields of work which were reported. This hope has been so well realized for the subject of reading, that at the Cleveland meeting the Executive Committee of the Society decided that it was very important to collect and publish the results of such studies as have been completed since Dean Gray made his report two years ago. This work was assigned to the committee whose names are signed to this report. These members were asked to suggest others who had something to contribute. Dr. Thorndike and Dean Haggerty found it impossible to finish their manuscripts in time to have them included in the *Yearbook*. Dr. O'Brien's study was submitted through Dr. Buckingham, under whose direction the investigation was made. Other contributors are indicated in the table of contents.

After considerable correspondence among members of the committee it seemed best to arrange the *Yearbook* in two sections, the first part dealing with investigations which presented data bearing on the problem of reading, the second part containing examples of concrete exercises which have been actually tried in the classroom. It was hoped to give a large proportion of the space to these classroom exercises, but the difficulty of gathering and editing them was so great that it has seemed necessary to include at this time only a few samples of lessons which were submitted, and to suggest that an entire *Yearbook* be later given to this work.

It is very essential that such studies as are described in the first part of this report be made. Teachers are particularly ready just now to undertake any new method which goes under the name of "silent reading." No doubt, the teaching which results from this interest will, in general, be superior to that which we have had in the past. On the other hand, many mistakes will be made, some of them perhaps quite serious. This is particularly likely to be true in the case of certain types of speed exercises. In a way, it is un-

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fortunate that changes in methods cannot be delayed until we have more assurance as to the efficiency of the methods which are being recommended.

The problems which need investigation are almost without limit. Most of them, however, may be grouped under five heads: first, the thorough-going analysis of the various types of reading abilities required in life outside the school; second, the construction of a course of study which would show the proper relation, on the one hand, between oral and silent reading, and, on the other hand, between reading and literature; third, a study of the problems of reading in the area where reading overlaps study; fourth, the discovery of exercises for the development of each of the major types of reading abilities; fifth, an investigation of the diagnosis and treatment of individual cases. These problems naturally overlap; each is a center of focus rather than an isolated problem.

In attacking any of these groups of problems it is important to distinguish among four qualities and to study the relation existing among them. These are speed (including skimming), comprehension, organization, and remembrance. There are, in addition to these, certain technical skills, such as the use of reference material in libraries, the use of encyclopedias, dictionaries, etc. There are also the various abilities involved in the proper use of indexes and tables of contents. Each of these abilities needs to be studied, moreover, in relation to the various types of materials which are commonly read and in relation to the various purposes for which these types of material are read.

The exercises which are given in Section II represent but a small sampling of a great number which were submitted. Since it was impossible to print all of the really excellent lessons which were reported, it seemed wise to include only exercises for the first three grades. Even with these limitations there was space but for a small part of the lessons which were submitted. The effort of the Chairman has been to select lessons which represent a wide range of types of exercises.

These lessons embody attempts to work out methods of teaching under the guidance of the data which have been disclosed by such investigations as were summarized by Dr. Gray in the *Eighteenth*

*Yearbook, Part II*, and as are also reported in the first section of this *Yearbook*. In this sense they represent experimental work. They are for the most part in the stage where the technique of practical method is being worked out. So far, little has been done to isolate and test the effect of any one exercise, but we have evidence that satisfactory results can be obtained from certain combinations of exercises. Studies like those of O'Brien and of Hoover in this *Yearbook*, for instance, lead to just such conclusions. The conclusions seem to be substantiated also by the superior scores made on the standard tests by schools which have featured such work, and by the rapid improvement which has resulted when such exercises have been introduced.

It is the opinion of the Committee that this or some similarly constituted committee should continue the study of these problems. As rapidly as possible the efficiency of each type of exercise should be scientifically determined. Investigation must of necessity be slow. Meanwhile, an exhaustive search should be made for all types of silent reading exercises which seem to give good results. These may be subjected by the Committee to a critical examination made in the light of present knowledge, and printed with explanatory notes as a future *Yearbook*.

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# SECTION 1

## CHAPTER I

### FACTORS AFFECTING RESULTS IN PRIMARY READING

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#### INTRODUCTION

Reading instruction may be said to be in a process of transition as regards aims, methods and content. If one examines the older literature, one frequently encounters such terms as "expression," "enunciation," "articulation," "pitch," "inflection," and "emphasis," while today "silent reading," "thought," "content value," "rate," and "individual differences" are terms which challenge the attention of the student. It is not difficult to locate the cause. The development of a more scientific attitude toward education has tended to make educators more critical. Studies of failures (16)<sup>1</sup>, the development of standard educational and intelligence tests and the use of methods of classroom experimentation have served to point out some of the shortcomings of the old system and to indicate some of the possibilities of the new. Even so, there has been far too little actual testing of results and too little experimentation to discover possible achievements. When we consider the time that is ordinarily given to primary reading and the bearing of reading achievement upon the future success of the child, it is important that we bring together such evidence as we have, concerning the effect of various factors in producing results. This article is offered as a brief summary of experimental evidences and current thought concerning factors affecting results in primary reading.

#### FACTORS

1. *Attendance.* For a group of children just learning to read, attendance is a factor that may be important. It is a matter of

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<sup>1</sup>Numbers in parentheses refer to the list of references at the end of this chapter.

observation that normal children sometimes fail to acquire satisfactory proficiency in primary reading, because of excessive absence. However, absences that aggregate less than two months in the course of a year probably have little effect upon attainment in primary reading as compared with such other factors as intelligence, quality of teaching and amount of reading done. The writer found the correlation between attendance and attainment on the Haggerty Achievement Reading Tests to be negligible for the children who had had kindergarten training, and who had attended school for 130 days or more at the time of the test in May.<sup>2</sup> The Pearson correlation between attendance and score for 210 first-grade children, selected at random, was .017 for Test I, —.003 for Test II, and .008 for the two tests combined. For 190 second-grade children, similarly selected, the corresponding figure in the case of Test I was .073 (31).

Long periods of interruption would probably interfere materially with progress. Packer and Anderson found in the case of rate of reading that summer vacation lowered it materially. Children in 1 B, who read 50 words per minute in May, read but 44 in September. Corresponding figures were: for 1 A, 84 and 49; for 2 B, 125 and 68; and for 2 A, 145 and 125, respectively (21).

2. *Time Devoted to Reading.* At first thought, many persons would probably say that results in primary reading vary directly with the time given to reading on the daily program. If all other factors were equal, this would probably be true within limits. Under present ways of teaching, other factors apparently overshadow it. The Pearson correlations obtained in our own study between total time (including recitation, study and phonics) and score on the Haggerty tests for 200 first-grade children, selected at random from a group of nearly 600, were slightly negative, being —.035 for Test I, —.153 for Test II, and —.102 for both tests com-

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<sup>2</sup> Figures recently given us by Miss Engel, of the Psychological Clinic at Detroit, indicate that a percentage of absence greater than 15, or a lesser amount of continuous absence, is causally related in a definite way to first-grade failure. The operation of this factor might not be revealed by the method of correlation, but it is revealed when differences in intelligence are first allowed for and the pupils then classified into those who are promoted and those who are not promoted.—*Editor.*

bined (31). The Spearman correlation obtained by Woody for Grades III, IV, and V between the number of minutes per week devoted to reading recitation (actual reading, phonics and word drills, exclusive of study) and the scores attained in the Monroe reading test were those of Table 1.

TABLE 1

CORRELATIONS BETWEEN TIME DEVOTED TO READING AND SCORES IN MONROE READING TEST (WOODY)

Grade	Number of Teachers Reporting	Correlation between time and comprehension scores	Correlation between time and rate scores
III	51	.13	.17
IV	52	.06	.29
V	60	.06	.05

This lack of correlation, he concludes, seems to indicate that other factors are more influential in determining the score attained than the time element (33). While these two studies are by no means conclusive, they indicate how completely other factors may submerge the time factor. It is entirely possible, *e. g.*, that many children may gain more from ten minutes spent in independent silent reading than they would in a twenty-minute oral-reading recitation period of the conventional type. Similarly, a class possessing a high average intelligence may make greater progress in half the time taken by one of low intelligence. Again, one teacher will use the entire period profitably while another squanders two-thirds of it. The teacher should endeavor constantly to have each child spend his reading time in ways that will be the most profitable to him.

3. *Kindergarten Training.* Does kindergarten training influence the character of the reading work done by children in the primary grades? No comprehensive studies of this problem have been made. Our own results with the Haggerty tests in the first grade showed that the group that had attended kindergarten exceeded the group that had not, even though their median ages were the same. The median score for the kindergarten group was 7.5 in Test I, and 4.2 in Test II, and for the non-kindergarten group 6.0 and 3.6, respectively. In the second grade, the kindergarten group

scored 13.8 in Test I, and 9.6 in Test II, while the non-kindergarten group scored 12.6 and 7.4, respectively. In the third grade the non-kindergarten group excelled. The number of pupils, however, was less in this grade, as the figures in Table 2 will show. The average difference between the kindergarten and non-kindergarten groups is roughly equal to one-fourth of the interval between the first and second grades (31).

TABLE 2

MEDIAN SCORES ON THE HAGGERTY ACHIEVEMENT READING TEST FOR KINDERGARTEN AND NON-KINDERGARTEN GROUPS

	Grade I		Grade II		Grade III	
	Test I	Test II	Test I	Test II	Test I	Test II
Kindergarten Group	7.5 (526)	4.2 (516)	13.8 (378)	9.6 (378)	17.8 (106)	15.6 (106)
Non-kindergarten Group	6.0 (92)	3.6 (91)	12.6 (77)	7.4 (70)	18.9 (70)	16.8 (59)

Figures in parenthesis indicate number of children.

4. *Intelligence and Mental Age.* Dickson had children of the low first grade segregated on the basis of intelligence quotient and mental age. After an experiment covering a year and a half, he concluded that "mental age and I. Q. are important factors in revealing a child's chances for success in his school work." Children who tested low were very slow to learn to read. They had little initiative. What they appeared to learn one day was not retained to the next. Much repetition was necessary. Their reading was marked by a tendency to name words without thought of their meaning. In a group of "borderzone" children (I. Q. 85 or below) only 6 could read in an easy primer after nearly a year and a half of effort under a strong primary teacher. Of 42 pupils who tested normal or above, "all but five passed the work of the first grade at the end of the term. The teacher attributed the failure of four of these to irregular attendance, and of one to excessive timidity."

In another school, thirty of the pupils, who tested below six years mentally, and who classified in the "dull normal" group, or below, were placed in a special first-grade division. Ten were repeating the work of the grade. At the end of two terms, under the experiment, two pupils out of the thirty were promoted into the "high first" grade, regular class. Near the end of the third term,

five more were ready (7). While this is but one experiment, the results are exceedingly significant for primary education. Haggerty has found that there is a significant correlation between intelligence and ability to perform the exercises of his primary reading tests (12). He correlated teachers' estimates of intelligence when weighted according to grade location, with scores on his reading tests. In the case of 200 pupils in Grades I to III the Pearson coefficients were .71 for Test I, .69 for Test II, and .76 for the two tests combined. Similar figures for 144 eight-year-old pupils were .67, .67, and .71, respectively. Using the scores obtained with his intelligence test, the figures were .65, .67, and .70 for the same group. For 200 pupils of Grades I and II the intelligence and reading tests yielded a correlation of .84. Terman reports five third grades tested by Dickson in the results shown in Table 3.

TABLE 3  
DISTRIBUTION OF INTELLIGENCE IN FIVE THIRD-GRADE ROOMS (AFTER DICKSON)

Room	Median Mental Age	Median I. Q.	Percent below 5.5 men- tal Age	Percent above 7 mental Age
A	6-0	87	31	10
B	5-7	76	46	5
C	6-0	85	20	20
D	7-2	108	14	60
E	7-8	112	0	71

He points out the average mental age of Room E was fully two years above that in Room B, and the median I. Q. 36 points higher. "One third of the pupils in Room A, and half of those in Room B were incapable of doing standard first-grade work." The lack of progress in Room B was so evident that the teacher was in despair and the superintendent doubted her efficiency (28).

Of all the factors which make for progress in primary reading, intelligence is probably the most significant. It has not, however, been sufficiently recognized in dealing with children.

5. *Chronological Age.* Chronological age at any stage of school life is less indicative of probable success than mental age, or mental maturity. The younger children of a grade on the whole excel the older in reading (*e. g.*, see 9, 30). Their superior intelligence enables them to do so. The six- and seven-year-old first-grade pupils

in St. Louis read better orally than the eight- and nine-year-olds. Similarly, in the second grade the seven- and eight-year-olds averaged better than the nine- and ten-year-olds. The average rate of silent reading in the second grade was found to decrease with age (9).

It is not surprising that our results showed no correlation between score on the Haggerty tests and age. For 210 first-grade pupils, and 190 second-grade pupils, selected at random, the correlations between age and score were zero, except one correlation of 0.13 between Test I and age in the second grade. These figures are too small to be of significance. If age were one of the strong factors in producing results in primary reading, we should expect to find a decided positive correlation between it and reading performance. Such a condition would mean, in general, that the older the child in a given grade, the better his reading. This, however, is not the case. Only in the event that we selected children of about the same intelligence quotient should we expect to find a positive correlation between chronological age and reading achievement.

6. *Nationality and Home Influence.* Foreign language spoken in the home is a distinct handicap to a child's reading development. This agrees with common observation. It is difficult, however, to determine the influence of nationality. Intelligence, rather than nationality *per se*, probably accounts for a large part of the differences in attainments of different language groups. The Rochester studies tend to show that Hebrew children can be expected to read better than foreign children of other nationalities, and that Italian children do not read as well. O'Hern concluded from the Rochester studies that foreign children made relatively better showings in oral than in silent reading. But even in oral reading tests "the children seemed to labor under a distinct language handicap. This

TABLE 4  
ORAL READING SCORES IN THE GRAY TEST BY PREDOMINATING NATIONALITY  
(AFTER JUDD)

Grade	Cleveland Average	American	Italian	Polish and Bohemian	Jewish
I	81	87	21	21	32
II	42	44	25	40	48
III	46	47	28	44	50

was decidedly noticeable in the case of Italian children. The differences due to nationality were more marked in the silent reading scores than in oral reading scores" (20). In Cleveland, as Table 4 shows, the oral reading of Jewish children was distinctly above that of the average, and that of Italian children much below. Poles and Bohemians were reported as making slow progress during the first year but approximating the average in the next four grades (16). In St. Louis, English-speaking and German-speaking children represent average achievement. "Jewish children rank above the average, and Italian pupils rank distinctly below the average. With the exception of German and Jewish children, practically all foreign-speaking children are seriously retarded by language handicaps." In quality of silent reading "foreign children made lower scores than did English-speaking children. Jewish children formed an exception to this rule. There seemed to be little correlation between rate of silent reading and nationality." The exact figures are not shown. In the case of oral reading, the report recommends that selections "be provided which are simple in construction and phraseology, and that will enable the pupil to develop gradually in the mastery of language forms as well as in the recognition of symbols." With reference to silent reading it recommends the extensive reading of simple selections which relate to familiar experiences (9).

7. *Oral Versus Silent Reading.* For many years, oral reading has played a lone part in our schools, particularly in the primary grades. The growing dissatisfaction with reading progress and the evident superior merit of practice in silent reading is now resulting in a movement to introduce a larger proportion of the latter into all grades. To what extent silent reading can be profitably substituted for oral in the primary grades is a matter that should be determined by careful experimentation. In the light of the evidence we now possess, there is nothing that would justify the amount of oral reading commonly found. It is becoming more and more evident that mechanical accuracy does not imply an understanding of the thought. Comprehension is less than in silent reading and rate is slower. Individual needs are not well satisfied.



Experimental evidence sufficient to establish the greater effectiveness of training in silent reading is not yet available. What we have is confined largely to the intermediate grades and has not always been produced under carefully controlled conditions. Woody correlated the estimated proportion of recitation time devoted to silent reading and class scores on the Monroe tests. Using the Spearman method, he obtained correlations of only  $-.21$ ,  $.00$ , and  $.01$  in Grades III, VII, and VIII, respectively, when based upon comprehension scores, and  $.00$ ,  $.10$ , and  $-.13$ , when based upon rate scores (33).

Pintner and Gilliland concluded that oral and silent reading were about equally effective in the third and fourth grades, but neglected some important factors (22). Both Mead and Pintner (cited by Gray) secured better reproduction in the intermediate grades from silent reading (10, 18, 24). These experiments presumably were performed on children who had been reared largely on an oral reading diet. Had these children had equal amounts of training in silent and oral reading, the results would probably have been more strongly in favor of silent reading. The greater facility with which thought may be acquired in silent reading results from the fact that attention need not be directed to mechanics. Among older children and adults, at least, eye pauses in oral reading commonly occur at short intervals. In silent reading, pupils are free to take in longer units, and this permits a better organization of the thought (17). Of 26 persons ranging from fourth grade to college, tested by C. T. Gray, 21 made fewer pauses per line silently than orally (8). Schmidt found the average number of pauses per line for 45 adults to be 6.5 in silent reading and 8.2 in oral reading (27).

The tenacity with which primary teachers have clung to oral reading is probably due to two causes. They know of no way to bring about improvement in oral reading except through oral reading, and they have not known how to conduct silent reading exercises. We firmly believe that experiments will prove that, even in the primary grades, oral reading ability can be developed through training in silent reading. Hawley secured marked gain in silent reading performances in the sixth grade through the use of daily

thought drill exercises and weekly thought tests. Without being emphasized, oral reading improved at the same time (13).

In the matter of reading rates in primary grades, the bulk of the evidence favors silent reading. W. S. Gray found that "the rate of silent reading for the second and third grades was less rapid than that of oral reading, when using selections of about equal difficulty" (10). He accounts for it by the fact that, "when a pupil is asked to read a selection for the content, he may read it more slowly than if he were reading it orally without directing special attention to content." It was probably due also to the fact that previous training had been chiefly in oral reading. He does not compare thought mastery in the two cases. Of the experimenters cited by him, Oberholtzer found the rate of silent reading in the third grade, as well as that of higher grades to be higher than that for oral. He obtained an oral rate of 2.1 words per second in the third grade and 2.2 words in the fourth. The silent reading rates in these grades are 2.3 and 2.6, respectively (19). Hendricks found that first-grade children read faster silently than orally (14). Judd's results showed that a greater number of lines per minute were read silently than orally in all grades. The second grade read thirteen lines orally and sixteen lines silently per minute from the Jones Reader (16). Unfortunately, much of the material used in making rate comparisons was not standardized. Lines, and even words, as Courtis has pointed out (5), are far from uniform in length.

The average variation in rate is much less in oral reading. This means that when children in a grade read orally their rates are more nearly alike than when they read silently, unhampered by the physiological mechanism of the voice. This may be seen from the figures of Table 5, which have been computed from those of the Cleveland Survey (16).

TABLE 5  
AVERAGE VARIATION IN RATES OF ORAL AND SILENT READING

	Grade II		Grade III	
	Oral	Silent	Oral	Silent
Average of five schools having lowest mean variation . . . . .	1.5	5.6	1.4	4.3
Average of five schools having highest mean variation . . . . .	2.3	10.6	2.9	12.5

The *possible rates* of silent reading for primary children have not been determined. Comparisons of oral and silent reading rates so far made have been with children whose previous reading training has been chiefly in oral reading. No one has taken a group of children trained for the first few years largely in silent reading and compared the silent reading rates of such children with the oral rates of others. Greater speed without loss in comprehension should be possible when children are trained to proceed directly from the symbol to the idea conveyed by it without passing through the intermediate step of oral rendition. Individual differences can be better met through silent reading, since the most rapid reader in a class usually possesses a rate for silent reading at least three times that of the slowest. It is important that provision for such differences be made. Many types of silent reading exercises permit each child to go at his maximal pace. In oral reading, the fast reader usually waits for the slow, even though, as is often the case, he possesses a silent reading rate double that of the best oral reader in the group. The rapid silent readers should not be compelled to follow the slow oral reading of their classmates to the detriment of their own rate and interest.

8. *Emphasis upon Meaning in Oral Reading.* Oral reading frequently fails to produce the results it could because of a lack of emphasis upon the meaning. To be satisfied with mechanical proficiency at the start is to invite trouble later. The pupil is apt to gain an entirely erroneous impression of the purpose of reading unless content is emphasized. The value of emphasizing thought was brought out in connection with the surveys of Cleveland, Grand Rapids, St. Louis, and other cities. Cleveland is known to have emphasized mechanics in the primary grades. St. Louis emphasized thought content primarily (9) and it makes a decidedly better

TABLE 6  
ABILITY IN ORAL READING—GRAY TEST

	I	II	III	IV	V	VI	VII	VIII
23 Illinois Cities.....	..	20	27	40	44	45	47	..
Cleveland .....	31	42	46	47	48	49	47	48
Gary .....	..	27	36	39	39	41	42	41
Grand Rapids .....	..	44	47	49	50	48	48	48
St. Louis .....	38	47	50	51	51	51	51	51

showing than other cities with which it is frequently compared, as for instance, in Table 6, from S. A. Courtis' report upon "Measurement of Classroom Products" in the Gary survey.

9. *Presenting Words in Context.* Gray, in the *Eighteenth Yearbook* of this Society, called attention to the experimental evidence of Cattell, Huey, and Boggs that words are more readily recognized if associated with content, particularly in the form of whole sentences. From the evidence he draws the significant conclusion that "the process of learning words in the early reading exercises will be facilitated by presenting them in sentences or longer passages, and by concentrating attention on the meaning of what is read" (2, 4, 11, 15).

10. *Phonics.* The exact relation of phonics to success in primary reading has never been satisfactorily established. Those who regard it as the most important factor in teaching children to read would introduce generous amounts of it. Others, less certain of its merits, would teach as little of phonics as possible. Currier and Duguid (6) carried on an experiment at Franklin, N. H., in which one group was given phonetic training during the first two years, and another was trained only with quick perception cards, and in sense contact methods. At the end of the period, the group with no phonetic training read more fluently and expressively, but less accurately. Foreign children and pupils with bad pronunciation habits, however, were helped by the phonetic training. Exact figures are not given. Zornow and others in Rochester concluded, after a systematic study of reading attainments and reading problems, that phonetic training is needed for foreign children not only to develop a method of attacking new words, but to sharpen auditory perception, and develop speech co-ordination (33).

This can be said for phonic analysis: possession of a system provides a pupil with a means of independent recognition of difficult words. Whether the acquisition of this ability is pure gain is another matter. As pointed out by Judd (cited by Gray), mechanical training temporarily prevents a child from understanding the meaning of passages (11, 17). The unit of recognition from the beginning should be the word. Analysis should be introduced

later when it is necessary to keep the word units clear. At any rate, phonic analysis is probably best taught outside of the regular reading period. This matter was treated in the *Eighteenth Yearbook*, from which we quote: "If such studies are made during the regular reading period, there is danger that attention will shift from the content of what is read to the study of individual words. If the basic training in the analysis of words is given during drill periods, the information and skill thus secured can be applied quickly and effectively during reading exercises without withdrawing attention from the content of what is read" (11).

The question of phonics or no phonics is perhaps of less importance than those of just what, how much, and for whom. Present practice is exceedingly wasteful. It is not uncommon to see an entire class spend several minutes daily in studying phonics with but scant thought of individual needs. Let those who need training on particular elements be given that training, but excuse those already familiar with them. The phonic content taught should have a direct bearing upon the reading in hand. Time is frequently wasted on material for which there will be no use except in the remote future. Whatever time is spent upon phonics should be spent profitably. That it is so spent can scarcely be said when classes that spend 15 or 20 minutes daily on phonics do no better than others that spend only five and ten, or when the correlations between the time devoted to phonics and the results of reading tests are zero or negative. The Pearson correlation coefficients obtained in our own study between time devoted to phonics and scores on the Haggerty tests for 200 first-grade children, selected at random, were—.148 for Test I, —.173 for Test II, and —.178 for the two combined (31). The correlation obtained by Woody in the third grade between the estimated proportion of time devoted to phonics, as reported by 47 teachers, and scores on the Monroe test was slightly positive. The Spearman correlation between time devoted to phonics and comprehension score was .31, and that between time devoted to phonics and rate score .23 (33). While these figures are by no means conclusive, they make it doubtful whether the teaching of phonics, *as now practiced*, has much bearing upon success in silent reading in primary grades.

11. *What Phonic System Is Most Effective in Teaching Primary Reading?* This question has often been raised, but never satisfactorily answered. Most publishers of systems in current use could probably be persuaded, with little difficulty, that their own system is second to none. The investigations made previous to 1919 were reviewed, and their limitations pointed out in this Society's *Yearbook* for that year (11). For the most part, these studies have been very narrow in scope; usually they have been limited to a few classes, and often to a single school system. Only a few phonic systems were considered in any one investigation. In some of these studies the attendance factor has been controlled and efforts have sometimes been made to control the teacher factor, but in no case has the factor of intelligence been taken into account. The latter two factors are probably of much greater importance than any particular phonic system itself.

In May, 1920, the writer secured results with the Haggerty reading tests from 15 school systems. The records of classes and schools using different phonic systems were compared. Records of those individuals who had been present less than 130 days, who were transferred from other schools, or who had not had the advan-

TABLE 7

MEDIAN CLASS SCORES FOR TEST I OF THE HAGGERTY READING TEST, CLASSIFIED  
ACCORDING TO THE PHONIC SYSTEM USED

Grade I	Aldine	Beacon	Elson	Gordon	Laurel	Natural	Progressive	Winston	Combination	Outlined by Supvr.
	3.4 9.0	6.0 6.5 8.0 10.8	2.3 4.3 4.5 4.8 6.0 6.5 16.3	6.8† 7.5 8.9	0.8 1.5 4.8 5.0* 5.0 5.4 7.0	6.3 8.5 9.2 9.3 9.5 9.8 10.0 10.1 13.3	6.1	8.3	5.3 6.5 10.5 11.7	10.5 12.0 13.2
Grade II	10.8 12.3 16.5 17.0 18.3		11.8 12.3 18.0 13.3 15.8 17.5*		8.0 9.5 11.3 11.3 14.4 16.0*	11.5 13.0 15.2 15.5 15.8 17.2 18.8	12.5		9.5 17.0	12.0† 12.8

†Two pupils skipped to 2nd Grade in half a year.

\*Class did not have kindergarten training.

‡Class had 4 different teachers during 1st semester of Grade II.

tage of kindergarten training were excluded. Although reports were received from 41 first-grade and 29 second-grade classes, the numbers were insufficient to warrant final conclusions. Not all of the good, nor all of the poor records were confined to classes trained in any one of the phonic systems, as Table 7 shows.

The system which produced the best class record in the first grade produced another that was among the poorest three. Two of the four best records were made by classes not reared by any of the commercialized systems, but on adaptations arranged by the teacher or the supervisor in charge (31).

12. *Eye Habits.* Most of the efforts to study eye habits have been confined to older children. C. T. Gray and Judd have noted that good readers tend to have fewer pauses per line in silent reading than poor readers of the same grade (8, 17). Gray's data show that the average number of eye pauses for 8 elementary-school pupils rated as good readers was 6.1 per line, while that of 9 poor readers observed in the same grades was 10.8. The good reader exhibits a tendency to group his words into phrases as the adult does. The records of the poor readers indicate a tendency to pause on every word or even oftener. Rapid readers commonly make only a few pauses within each line. Huey cites evidence showing that slow readers read a word at a time, while rapid readers take in longer units. Some rapid readers, however, were found by C. T. Gray to make large numbers of short pauses per line. The slow reader makes frequent regressive movements. The most efficient reading was done by those who made few pauses and used longer periods of assimilation. Gray's results show that the eye-voice span in oral is longer in the case of good readers. Phrasing practice, particularly of the flash type, will probably tend to reduce the number of eye pauses per line and increase both comprehension and rate. The writer has found repeatedly through informal flash testing in primary and intermediate grades that the quantity of reproduction is decidedly larger in the case of pupils who are in the habit of phrasing. Practice in the type of work probably tends to decrease the number of eye pauses per line and consequently to facilitate thought mastery. C. T. Gray's study shows that practice in rapid silent reading decreased the number of eye pauses

per line. Twenty days' practice in the case of one poor reader reduced the average number from 15.5 to 6.1 without decreasing comprehension in any material way (8).\*

13. *Vocalization.* Vocalization during silent reading is common among primary children. The origin in most cases can probably be traced to oral reading. Having become accustomed to the process of oral reading, many children employ the same laborious process in silent reading, though not allowing the oral expression to become audible. Instead of proceeding directly from the symbol to the idea expressed, they tend to give it oral expression first.

The effect of vocalization, as far as evidence goes, is to retard rate. Its effect on comprehension is less clear. Of the investigators referred to by W. S. Gray, Hendricks found that among first-grade children there was no appreciable difference between lip movers and non-lip movers, but among fourth-grade and eighth-grade children, the non-lip movers read faster. The ten slowest adult readers studied by Quantz showed nearly twice as much lip movement as the most rapid (10, 14, 23). Pintner, also experimenting with adults, found that "practice in reading without articulation increases the ordinary rate of reading;" that "articulation during the reading process is a habit which is not necessary for that process; that practice in reading without articulation can make such reading as good as the ordinary reading of the same individual; that practice in reading without articulation tends to aid ordinary reading most probably by shortening the habitual practice of articulation" (25).

C. T. Gray found that twenty days of practice in reading without vocalization decreased the amount of motor accompaniment of reading and increased rate. While more of his pupils lost than gained in comprehension, it is not a fair assumption that vocalization increases comprehension (8). It is both conceivable and probable that children who have been trained primarily in oral reading may lose in comprehension when first asked to read without vocalizing. But that they will continue to suffer in comprehension, we

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\* See the chapter by W. S. Gray in this *Yearbook* for further illustrations.—  
*Editor.*



have no evidence, nor have we any that they would do so at all, if trained to read silently from the beginning.

14. *Amount of Reading.* "Learn to read by reading" is a familiar maxim. We have not yet witnessed a sufficient amount of experimentation under controlled conditions to enable us to say just what influence the quantity of material read has. It is conceivable that children may read large quantities of material in a slipshod fashion and gain but little as a result. On the other hand, it is also conceivable that a smaller amount of careful reading may produce a good reader. The general trend of teachers' opinions seems to be that good readers are produced by a large amount of reading. This contention is not without merit. Schools in which a large number of books is read in primary grades as a rule produce strong readers, in comparison with those where little is read, *e. g.*, city vs. rural schools. In the St. Louis survey a large proportion of the pupils were found to be reading many books silently during the second and third grades. In some classes the children read as many as one book a week. The tests showed that these children were markedly superior to those who did not have such opportunity (9, p. 179). The extensive reader acquires a wide field of experience, secures much practice in silent reading for the thought, the thread of the story, or the points of interest. He becomes practiced in phrasing. His vocabulary is increased through acquisition of words whose meaning is gathered from the context.

There is also to be considered the question of the relation of amount read to the rate of reading. We may well ask whether children read more because they read rapidly, or whether they can read fast because they read much. We know that, other factors being equal, the child possessing the higher rate reads more in a given period, but we are not at present able to say how much a child's rate will be improved as a result of a given amount of reading. It is very likely true that for many children extended reading improves rate materially.

Correlations between quantity of reading and reading test scores have been computed in only a few instances. Miss Zirbes' data for fourth-grade children show an average Spearman correlation for three separate measurements of .53 between rate and number of

books read at home (32). Woody asked teachers in Grades III, IV, and V to estimate the number of pages their classes read (both regular and supplementary reading) during a current semester. He then correlated this figure with comprehension and with rate on the Monroe test (33). His figures, by the Spearman method, are embodied in Table 8, where it will be seen that the third-grade

TABLE 8

Grade	No. of Teachers Reporting	Amount and Comprehension	Amount and Rate
III	31	.46	.35
IV	34	.02	.02
V	36	.15	.04

correlation is rather marked but that of the other grades is not. Our own Pearson correlations (31) between score on the Haggerty reading tests and books read by each individual during the year, as reported by teachers for Grades I and II are shown in Table 9,

TABLE 9

CORRELATIONS BETWEEN AMOUNT READ AND SCORES IN READING TESTS (THEISEN)

Grade	No. Pupils	Amount and Score on Test I	Amount and Score on Test II
I	210	.47	.44
II	190	.14	.09

where, again, the figures are significant in one grade and not in the other. A more refined method of recording the amounts read would probably have raised the correlation, since the good reader in the primary grades is likely to choose longer selections.

For the relatively unskilled teacher, at least, quantitative silent reading should undoubtedly be urged, even though well-trained teachers may secure very good results with a much smaller quantity. Each schoolroom should have a library of its own, with single copies of many books and arrangements for frequent exchange with other schools.

15. *Difficulty of Reading Materials.* The reaction of the average adult toward a selection that presents any considerable number of new and difficult words, or that is difficult to comprehend, is usually to lay it aside in disgust. The reaction of the beginner

would probably be much the same, were he less naive and submissive. Material in which the vocabulary offers numerous obstacles necessitates constant shifting of attention from the thought, and consequently from story interest, to mechanics. The vocabulary is likely to be so far in advance of the reader's that he cannot appreciate the thought. Easy material is conducive to organization into longer thought units. This in turn stimulates rate. For the average primary teacher, more satisfactory results will be obtained by the use of easy reading materials. Brinkerhoff concluded as a result of his study that "probably an extensive use of easy reading books throughout the primary grades will produce rapidity. The present practice of having pupils read difficult books in the lower grades is vicious, because it prevents the establishment of proper reading habits" (3).

16. *Provision for Individual Differences.* To our knowledge no one has yet attempted to measure the advantage to be had from careful provision for individual abilities and needs, as against the conventional form of class teaching. Primary children differ not only in intelligence, maturity, experience and interest, but in their proficiency in each of the various elements that go to make up primary reading ability. They differ materially in breadth of vocabulary, in knowledge of phonics, in eye habits, in amount of vocalization, in fluency and correctness of oral reading, in type of material they can comprehend and in rate of reading. In the usual classroom procedure, few of these facts are taken into consideration. Were primary children to be placed, when occasion demands, with others whose acquirements and abilities were similar, and treated accordingly, it is not improbable that we should need to establish newer and higher standards of accomplishment for them.

A recent inquiry (29) brought out, among others, these valuable suggestions for adapting primary reading instruction to individual differences: (a) voluntary reading in free periods, (b) arranging pupils into small groups on the basis of ability, (c) testing of reading ability and intelligence to determine what may be expected of each pupil, (d) independent silent reading, (e) permitting the rapid reader to cover longer portions, (f) specific help and treatment of individual defects, (g) individual word, phonic and phrase

drills, which do not require children to spend time on what they already know well for the sake of the few who have such difficulties, (h) thought drills, (i) grading of materials to fit individual ability, with easy material placed in the hands of the weaker, and more advanced in the hands of the stronger, (j) home reading, (k) choice of materials on the basis of individual interests, (l) stimulation of individual efforts through motivation, and (m) rate drills. The justification for such measures is obvious. To this list should be added such provisions as can be made for promotion and for proper attention to physical needs.

We have pointed out elsewhere what may be expected where provision is made for differences in intelligence. Just what to expect when adequate provisions are made for individual differences in other respects is still a matter of conjecture that needs to be determined experimentally.

17. *Diagnostic Study and Treatment of Individual Needs.* As Anderson and Merton have expressed it, "Much of the weakness in our methods of teaching reading is due to our system of mass instruction, which does not attempt to discover the sources of the reading ailments of individuals, but which prescribes a patent nostrum that, it is hoped, will cure all reading ills" (1). Uhl diagnosed the reading of the third-grade children along with higher grades. He found the accuracy of diagnosis such that no poor reader made good records in all tests, while the specific defects of poor readers could be detected. He concludes that for many who fail to profit by class instruction, carefully planned individual treatment will produce as rapid growth as is produced in the case

TABLE 10  
DISTRIBUTION OF 909 ERRORS IN THE ORAL READING OF 91 PUPILS  
(ANDERSON AND MERTON)

Types of Error	No.	Percent	Types of Errors	No.	Percent
Repetitions . . . . .	138	15	Additions not changing meaning . . . . .	21	2
Insertions . . . . .	125	14	Vowel sounds . . . . .	15	2
Omissions . . . . .	71	8	Confusing letters not governed by rule . . . . .	9	1
Substitutions . . . . .	220	24	Wrong syllables . . . . .	24	3
Mispronunciation . . . . .	30	3	Repetition to correct errors . . . . .	25	3
Accent . . . . .	33	4	Not attempted . . . . .	5	1
Portions omitted . . . . .	65	7			
Portions inserted . . . . .	90	10			
Omissions not changing meaning . . . . .	38	4			

of many apparently brighter pupils by class instruction (32). Anderson and Merton found that 909 oral reading errors of 91 pupils were distributed as in Table 10.

Such studies of the frequency of different types of error in both silent and oral reading form a definite part of the reading instruction in the schools at Stoughton, Wisconsin. Treatment is given poor readers in accord with the diagnosis of their cases. They report what was accomplished with a second-grade pupil demoted after a trial in the third grade. He could not read primer material satisfactorily. His case was diagnosed as "lack of familiarity with the printed words and an utter lack of phonetic power." He was given instruction in phonics for one month, and from then on, a combination of phonics, oral reading, and silent reading for rate and quality, with the emphasis upon oral reading for quality. In all, he received 36 special lessons. His record on the Gray Reading Test at the beginning and at the end showed: "(1) Rate almost doubled; (2) quality more than doubled and 4 points above the standard for his grade; (3) lip movement eliminated." In this school system, where special efforts were made to study and to treat individual needs, "the median rate of the second grade increased from 74 words per minute in November to 193 in May. The third grade increased from 113 to 200." "Before a teacher can do efficient work with a reading class, she needs to know what problems she is meeting, what defects must be remedied. Her work must be with small groups of three or four pupils, rather than with masses. She should work with these groups to overcome reading defects" (1).

18. *Interest.* Interest is a factor the exact effect of which is still undetermined. It is a commonly accepted principle of psychology that effort is proportional to interest. Motive conditions results. Writers of primary reading materials have not always been careful to provide for the item of interest. Some of the books to be had for primary children are particularly lacking in this element. Of those purporting to be interesting, many are based only upon shallow, superficial interests. In their earnest desire to have beginning children master a particular phonic system, teachers are in grave danger of overlooking the factor of interest. Most teachers

probably do not make sufficient attempt to discover the particular likes and dislikes of each child, and to build accordingly. In response to an inquiry on provisions for individual differences sent to a group of successful teachers, it was found that "only 15 percent of the primary teachers apparently made serious efforts to fathom the interests of the individual child." In grammar grades, where teachers are forced by circumstances to study interests, the percent was more than twice that in the primary grades (29).

The interests of primary children differ with age, maturity, home surroundings, experience, school training and previous reading. Differences are frequently exhibited by the members of a class. The teacher's problem is to discover each child's interests, and to develop and broaden them. Some teachers make progress in this direction by observing each child carefully, discussing with him his likes and dislikes, and noting his home and out-of-door interests, or what he reads when free to choose from a large variety of material.

19. *Supervision.* Very few figures are available on the effects of supervision, but the few that are available tend to show that a small amount of supervision is likely to produce large gains. Miss Reichert, at Madison, by six weeks' supervision secured a comprehension score of 11.3 on the Monroe reading test, Form II, for the supervised class, where the two control classes scored 8.5 and 8.1. At the beginning of the experiment the classes had scored 5.5, 5.3, and 5.3, respectively, on Form I. In the supervised class, a diagnostic study of individual needs was made. Pupils were grouped on the basis of ability, and training in thought-getting was given. The proportion of silent reading was increased. Material varying from difficult first-grade to difficult fourth-grade was used, depending upon the ability of the child. Phonic training and phrase drill were given to those needing it. Home reading was encouraged (26). In many schoolrooms, a supervisor would probably need but to show the teacher how to put the most obvious steps into operation to produce marked gains. There is so much sheer wasting of pupils' time on the part of unskilled teachers that improvement is easily possible. The presence of a reading supervisor properly equipped for the task is to be welcomed.

20. *The Quality of the Teaching.* Aside from intelligence, none of the factors affecting results in primary reading is more important than the quality of the teaching. Just how much influence a given quality of teaching has, when spread over a given interval of time, has unfortunately never been accurately determined. This is due in part to the difficulty of securing reliable measures of the quality of the teaching, and in part to the fact that until recently we have lacked standardized tests of primary reading achievements. The improvement secured by Miss Reichert, previously cited, is indicative of what may be expected when superior teaching is secured (26).

While all of the various factors we have discussed do evidently enter into the teaching, their sum does not make the teacher. The quality of the teaching will be improved, it is true, by a due regard for the importance of each of these factors, but their sum, we repeat, does not make the teacher. The additional elements of judgment, regard for values, encouragement, ability to stimulate children, executive skill and classroom management must be supplied by her. Unless she is a master of the technique of instruction, knows the tendencies of her children, and is familiar with the subject matter, she will not achieve the best results. It is not at all improbable that when a school obtains a highly favorable condition with reference to all of these factors, we shall reach new and unheard-of standards of achievement in primary reading.

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## CHAPTER II

### CONTROLLING FACTORS IN THE MEASUREMENT OF SILENT READING

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During the past year the Department of Education of the Russell Sage Foundation has conducted a series of studies in the measurement of silent reading. This work has produced a scale for measuring the silent reading of children in grades three to eight. The scale itself consists of a large sheet of paper on which are printed 20 little pictures with a paragraph under each one, telling the pupil to make a line or mark with his pencil to supplement the picture. The number of paragraphs that he can read and mark correctly within the time limit of five minutes is taken as the measure of his ability, in this particular sort of careful silent reading. The scale is designated as Picture Supplement Scale 1, or PS-1.

It should be noted that the testing material of this new silent reading scale is of uniform difficulty throughout, and that a definite time limit has been set. That is, difficulty and time have been held constant, and the variable which has been measured is the amount which the child can do. These characteristics of Picture Supplement Scale 1 were not found in all of the earlier testing material used by the Foundation in its silent reading experiments. They are the results of many changes which have been carried on in the effort of the Department to make the test conform to the fundamental principle of measurement, "the law of the single variable." It is with some of the problems arising in the endeavor to apply this principle to the measurement of silent reading that this article is intended to deal.

## THE LAW OF THE SINGLE VARIABLE

A few months ago, newspapers in different parts of the country were filled with humorous references to the troubles of the Mayor of Providence, Rhode Island, who had come in conflict with the law of the single variable. According to the newspaper accounts, an Italian, who had formerly lived in Providence, and wished to show his affection for the city, left in his will a sum of money which was to be awarded by the mayor to the most beautiful and virtuous girl in the city. The mayor devoted considerable thought to his problem. It might be possible to measure the beauty of the young women of Providence. It might be possible, although the difficulties involved were rather staggering, to arrive at some measure of womanly virtue; but to contrive a measure which would successfully discover the girl possessing the most perfect combination of beauty and virtue was too difficult a task for even the courageous mayor, and the newspapers say that he refused to accept the trust. He could not measure two variables in combination.

Measurement is the process of comparing a given sample with a standard sample, and stating the proportion it bears to the standard, in terms of the standard unit. Length is measured in feet, time in seconds, weight in pounds; always the results of measurement are given as specified amounts of a single standard unit. Tests may furnish simultaneously several different kinds of results, and each of these results may be measured in terms of its relation to the standard unit of its kind. It is clear, however, that if different results are to be compared with each other, they must be of the same sort; they must be expressed in common terms. The law of the single variable is to the effect that, in the measurement of comparative attainments, only one element can be measured at a time; and when one element has been chosen as the variable to be measured, every other conditioning element which might affect the result shall be held constant.

The principle of the single variable is accepted, not only by the Mayor of Providence, but by chemists, physicists, and biologists; by carpenters and clerks, by schoolboys, and milkmen, and professional pugilists. It is the universally accepted principle

of measurement in the affairs of everyday life. We measure, for example, "How far this man can run in a given time," and "How fast he can run a given distance," but we do not even attempt to measure "How far he can run how fast." Whether we have clearly formulated it for ourselves or not, in practice we obey the law of the single variable. In comparative measurement, we try to measure only one thing at a time.

#### SCALES MEASURE QUALITY, DIFFICULTY, AND AMOUNT

As part of the experimental work in connection with the silent reading study, a careful examination and tabulation was made of the principal existing scales for the measurement of ability in classroom subjects. It was found that without exception every scale seeks to measure one of three elements. It seeks to answer one of three questions: "How well can he do?" "How hard can he do?" or "How much can he do?" It measures quality of product, difficulty reached, or amount done. If the term *amount* be taken to include its companion term, *time*—and it must be so treated, since the two are mutually dependent; time implies amount, and amount implies time—then every careful comparative measure that we make will be found upon close examination to be primarily concerned with one of these three elements. In dancing we compare quality; in jumping we compare difficulty; in swimming we compare time or amount.

Moreover, we successfully compare only one sort of measure at a time; and when we try to compare measures in combination we open the way for endless arguments and misunderstandings. In diving contests, for example, where the difficulty is set, so that contestants all make the same sorts of dives, it is easy to judge them on the basis of comparative quality. Where, however, each contestant is allowed three dives of his own choosing, and the judges try to decide who made the most difficult dive best, decisions are continually questioned and become matters of hot controversy with little hope of satisfactory settlement. Such judgments are of the crudest sort and do not pretend to scientific accuracy. Scales which seriously attempt comparative measure-

ments always chose one of three elements—difficulty, quality, or amount—and only one, as the variable they seek to measure.

In any scheme of scientific measurement, after the variable has been chosen, the two remaining factors must be carefully studied. Either methods must be devised to hold them constant or it must be shown that they are without power to affect the scores in the particular field where the measurements are to be made. That is, where one of the three factors of quality, difficulty, and amount is chosen as the variable, the results of which are to be noted, the remaining two factors must be restrained from influencing those results. In some cases it can be shown that no special restraints are required, since variations of one factor have no influence upon the other; but such mutual independence cannot be taken for granted. It must be definitely proved, and the burden of proof rests upon the person who is responsible for making the scale.

#### READING NOT MEASURED BY SCALES FOR QUALITY OF PRODUCT

The first problem in studying silent reading is to decide which of the three factors—quality, difficulty, or time—shall be chosen as the variable to be measured. In the study here described the conclusion was reached that reading is a classroom activity which does not readily lend itself to measurement by means of scales for quality of product. Quality in reading is an elusive thing which varies not only with different people, but with the same person from moment to moment as he reads. There are as many different reactions which children get out of reading as there are children, and as there are times that children read. The reading process awakens in consciousness thoughts and memories of the most varied character. In re-reading even a simple passage, the same individual gets new meanings from the page, new and different mental reactions from the same stimuli.

Moreover, outside of the psychologist's laboratory, the shades of quality of reading are not of great import. For practical purposes, the problem of measuring reading involves finding out how rapidly the subject reads the material with a sufficient degree of comprehension to get from it the essentials of its meaning.

As the material increases in difficulty, the ability to read it is rarer; but the important question is not "How full and varied is the meaning the reader draws from it?" but rather "Is he able to grasp the gist of the material?" The quality element is reduced to the very simple one of, "Well enough to get the essential thought."

#### READING NOT MEASURED BY SCALES FOR DIFFICULTY REACHED

There are several well recognized tests which consist of graded series of progressively difficult tasks, where the hardest task successfully completed is taken to measure the degree of accomplishment shown. No time limit is set, since it is assumed that the results achieved in the test are independent of the time needed. These are scales for difficulty reached.

In the early experimental work of the Foundation, a tentative reading scale of this kind was devised, which was similar to the present Picture Supplement Scale 1 in that it consisted of little pictures with paragraphs of instructions about them. In the former scale, however, instructions were graded in reading difficulty, so that in the earlier paragraphs sentences were short and the words were those most commonly used, while paragraphs towards the end of the scale consisted of longer sentences and words so rarely used that they do not enter into the speaking vocabularies of most high-school or college students. Children were allowed to work as long as they wished, and it was assumed that the hardest paragraph attempted and read successfully would mark the limit of the child's reading ability.

To the embarrassment of those conducting the experiments, it was found that under these conditions, almost every child was able to read everything. That is, if the thought and style were easy to grasp, and there was no time limit, even the littlest children showed an amazing ability to puzzle out the meaning of the hardest words. For example, a picture of the cross used in the anti-tuberculosis campaign was accompanied by the following instructions:

"Since TB is the usual abbreviation for tuberculosis, print the two initials closely contiguous to this celebrated emblem of the American Tuberculosis

Association. In doing so, be careful to select such locations as will result in the separation of the initials by the intervention of the emblem between them."

Third-grade children, Italians, on the lower east-side of New York City, who were counted by their teachers as exceptionally poor in reading, and were not themselves able to use English fluently, read that paragraph, re-read it, and finally with shining eyes grasped their pencils and printed T on one side and B on the other side, closely crowded against the central cross. They could not have defined the words, but they could discover what the paragraph meant if given long enough time to puzzle it out. The same result occurred over and over, with other forms of test material, even such as, under the picture of the veiled lady, requested the children to "perpetrate an incision in the facial vesture immediately anterior to the buccal orifice through which the fastidious female may procure aliment."

In these early silent reading experiments, the three fundamental factors of quality, difficulty, and time had been recognized. The quality requirement had been held constant, at the low level of "well enough to get the gist," and it had been assumed that where the reading material was difficult, the time consumed was of no great importance. It was thought that a child either could, or could not, read so as to understand a given selection, and that no amount of additional time would materially improve his performance. The experiments established that, far from being unimportant, time is in reality very nearly the most powerful controlling factor in silent reading. It must either be measured or controlled.

An easy solution of the problem thus confronting the investigators would have been to keep the test material as it stood in gradually increasing steps of difficulty, and set a time limit. It seemed clear, however, that this solution would not be satisfactory, because it would violate the fundamental law of measurement, which declares that only one variable can be measured at a time. The difficulty of equating time and accomplishment is as great as the difficulty confronting the Mayor of Providence of equating beauty and virtue. Girls of equal virtue might be arranged in order of beauty, or girls of equal beauty according to

their relative virtue; but the two attributes could not be mixed in unknown and varying proportions and the results compared or interpreted. Similarly, in measuring reading there seemed to be no statistically valid way of equating "Difficulty 10 reached and three paragraphs wrong," with "Difficulty 6 reached and none wrong," or "Difficulty 12 reached in four minutes" with "Difficulty 16 reached in five minutes." The results are not comparable because they are the sums of two variables, in unknown proportions.

If difficulty was to be measured, the time element must be restrained from influencing the result. It might be possible to allow the difficulty of each paragraph to vary, and to record the rate of each child on each paragraph. This would, in effect, be the same as giving the children a series of tests, one at each level of difficulty, and measuring the amount done at each level in a given time. Such a measurement would be defensible from the purely scientific standpoint, but would entail a number of practical difficulties of administration, with which the classroom teacher is hardly able to cope.

Another alternative was to increase the difficulty by means of abstruse thought, unusual style, catches, puzzles, and technical phraseology, to such a degree that no amount of increased time would assist in interpreting the meaning. This second method raised the serious question whether material so hard that the child cannot understand it, either when reading to himself or when listening to some one else reading or repeating it aloud, can properly be used to measure reading. Such material would appear to test general intelligence rather than ability to secure meaning from the printed symbol. In the experiments here described, the conclusion was definitely reached that reading ability cannot legitimately be measured by exercises in which difficulty has been created artificially through complicating the thought, confusing the style, or inserting puzzles or catches intended to trip the reader.

The experience of the investigators in trying to construct scales for difficulty in reading, suggests that there will probably be found very few classroom subjects in which difficulty can be



measured directly, without reference to time. It will be noted that most of those who have devised scales for difficulty have been obliged to set time limits, even while declaring that time is not a conditioning factor. Where such a time limit is set for the scale as a whole, but none is set for individual paragraphs or problems of varying difficulties, the scores made must necessarily be affected by the rate at which the child works. He may have stopped at a certain point because he could not do work any harder or because he could not work any faster. Nothing in the score enables the examiner to tell what portion of it is attributable to ability, and what to speed. The most that such a test can tell is "Who reached the highest difficulty first." It cannot tell "Who would have gone highest had enough time been given," or "Who is the fastest worker."

If scales are to be of help to the classroom teacher, they must furnish more definite information than that. She already knows that some of her children can do harder work than others. What she needs to know, and what the scales that are given her should be designed to tell, is which children should be warned to go more slowly and which encouraged to work faster; who needs to be scolded for careless work, and who should be taught the difficult art of neglecting unimportant details. Then, in addition to, and separated from, these diagnostic facts of rate and accuracy, she must know at what points children are failing to understand her teaching. Scales which are to be of diagnostic help, must result in simple scores, which can be relied on, and readily interpreted. There is reason to believe that, in the future, scales to measure comparative ability in classroom subjects will generally fall into the two groups of scales for quality and scales for amount; and it is probable, also, that difficulty will eventually be measured indirectly, by means of series of carefully graded scales for amount.

#### READING MEASURED BY SCALES FOR AMOUNT DONE

Having decided that reading cannot readily be measured either by scales for quality or by scales for difficulty, it was necessary to ascertain whether it could be measured by the third

remaining method, that of scales for amount done. Scales which seek to measure amount must be so constructed that quality, difficulty, and time, and their subsidiary elements, are all held constant, and the variable which is to be measured and compared is the amount of work which the child can do under such standard conditions. In the measurement of silent reading, therefore, the measurement by scales for amount demanded that quality, difficulty, and time be maintained constant. It was decided to adopt as the standard of quality, the ability to secure the fundamental meaning of a paragraph well enough to act in accordance with it. The child must read well enough to get the gist of the material; his reading must be of the quality necessary in the ordinary reading of everyday life. Through the most careful sort of writing, testing, and re-writing, the difficulty of each paragraph must be maintained at a given level throughout the test; and a time limit, during which the children should be allowed to work, must be determined. With these general considerations well in mind, the measurement of silent reading through scales for amount was finally undertaken.

#### FACTORS INVOLVED IN TIME AND DIFFICULTY

The decision to treat amount as the variable and to hold quality, difficulty, and time constant, immediately brought into question all those subsidiary elements which also must be controlled and held constant if the scores resulting from measurement are to be purely in terms of quantity done, under uniform testing conditions. It is clear, for example, that if a paragraph is constructed in such an involved style that the child has to stop to puzzle out its meaning, his score will be lowered, not because the child is a poor reader, but because the author of the test is a poor writer. So again, a paragraph calling upon the child to compute the age of Uncle's Father may give the child a poor reading score which should really be charged to lack of skill in arithmetic.

Accordingly, having decided that the required quality should be the passing mark of "well enough to get the gist," and that time and difficulty should be maintained at constant levels

throughout the testing material, three further steps were necessary before the material itself could be used as a basis for constructing the final scale. The first step was to identify and list as many as possible of the elements which tend to affect either the difficulty of the reading material or the time required to read it. The list actually used in preparing Scale PS-1 is here presented:

#### CONTROLLING FACTORS IN SILENT READING

(Subsidiary elements of time and difficulty which must be eliminated or held constant.)

##### *To Be Eliminated*

Complex thought  
Abstract thought  
Technical thought and language  
Catches, puzzles, accidental leads  
Demands for spatial imagination  
Irrelevant dramatic appeal  
Ability to reproduce  
Ability to remember  
Ability to reason, or infer  
Involved style

##### *To Be Held Constant Throughout Test*

Memory span requirements  
Attention span, multiple strains  
Difficulty of action demanded  
Time required for complying with instructions  
Vocabulary difficulty  
Sentence structure  
Word arrangement  
Amount of material to be read  
Uniformity of print  
Uniformity of space relations between pictures and print  
Ease of finding place on paper  
Interest and corresponding effort on part of child

The second step was to eliminate as many as possible of these dangerous subsidiary factors; and the third step, to contrive methods by which the remaining factors could be rendered harmless by equalizing their influence in all the sections of the test.

After the list of controlling factors had been compiled, certain of them were chosen as those which might, or clearly should, be eliminated. It was decided, for example, that the thought should always be simple. The child should not be called upon to reason or to infer. He should not be expected to grasp abstractions, or complexities of thought. Technical language should be avoided,

and there should be no demand for special technical knowledge. Puzzle questions were ruled out, and so, more difficult to avoid, but equally dangerous, were the accidental catches or leads, in which unwisely emphasized words tricked the child into wrong responses.

In the particular scale under discussion, one of the extraneous factors most difficult to rule out was that of irrelevant dramatic appeal. There was the picture of the dog, for instance, which still appears at the top of the first column in the present scale. As originally written, the paragraph underneath the dog read as follows:

This dog sees a cat in the street. He does not like cats, and he hates this one. He will watch her and if she comes too near he will bark at her and chase her up a tree. We do not want him to chase the cat. Take your pencil and draw a strong rope about his neck so that he can not run after her.

That was an easy paragraph to read, but it proved to have more catches than any other in the entire collection. In the first place, while most of the children drew the "strong rope about his neck" in a single rapid stroke, there were one or two extra bright children who did not intend to be caught that way. In each set of papers there were always a few in which "strong rope" was represented by a cable of huge size, with every twisting strand carefully drawn and shaded, to prove to the teacher that the child taking the test knew exactly what a rope looks like, as contrasted with the possible string or chain.

Then again, when the "strong rope" had been deleted, the paragraph still made trouble because of its dramatic appeal. It practically always made the children laugh. They looked up at the teacher to see if she enjoyed the joke as well as they did. They smiled across the aisles and pointed to the picture to show their neighbors that it was the first picture, the one with the dog, which struck them as particularly funny. After they settled down, the dramatic possibilities worked havoc, for the brighter children could not resist the temptation to make drawings with fences—picket fences—to keep the dog in, a sturdy tree for the cat to climb, and even the cat herself, half way up the tree, with fluffed out tail, and claws digging desperately into

the wood. It was an excellent exercise for the imagination, but disastrous in a carefully timed reading test. In his latest form, the dog has stolen two bones and forgotten about the cat. The children do not like him so well, but he is much better material for testing!

Demands upon the ability to reproduce, to remember, and to answer questions were carefully excluded, because of the danger, as in arithmetical tasks, of unintentionally testing qualities commonly associated with reading, but not genuine elements in reading ability. The responses called for were made so simple that even very young children, far below the grades for which the scale is intended, were readily able to comply with them. The number of main ideas in each paragraph was carefully restricted to well within the attention span and memory span of the younger children, and these ideas were distributed through the paragraph in such a way as to make guessing difficult. Length of paragraph, size of print, size of picture, and relation of picture to print were kept uniform throughout the test, so that differences in style and make-up would not be responsible for differences in scores.

It was found that close attention had to be paid to the children's own reactions towards what they read. One illustration showed an open book, and the instructions were to make a small cross upon the right-hand page, so that the reader would be able to find his place again. This was a mistake. In school, children are taught never to mark their books, and they were obedient, even at the cost of failing in the reading test. The paragraph was re-worded, so that the children were told to draw a line representing a ruler lying straight across the book to hold the pages open. This wording proved to have an unforeseen catch, because the idea of one line was not sufficiently emphasized, and many children carefully drew rulers, with all the inches marked and numbered. The final wording runs "Draw a single straight line, to represent a ruler," and the paragraph now seems to be in satisfactory shape.

The children wanted the examiners to be reasonable and logical. If the tasks required offended them, they worked slowly or carelessly. To keep interest and effort high enough, but not

too high, and to keep them uniformly at the same pitch through the entire duration of the test, was one of the most difficult of all the problems met in the preparation of the testing material.

#### TEST MAKING IS A TWO-FOLD PROCESS

It will be seen from the foregoing illustrations, that the process of preparing test material was an alternating one of painstaking scrutiny and analysis within the office, and careful testing of the new material in the classroom. It seemed clear that neither part of the process could be dispensed with. Testing alone left undiscovered many alien factors which tended to pervert the results. One of the paragraphs showed a football player, and asked the children to draw the football soaring through the air. Classroom trials seemed to indicate that the paragraph was too easy to read, since few children failed on it. Office consultation, however, with critical scrutiny of paragraph and picture, showed that the paragraph had never really been tested. Given that picture, with no print at all, if told to make a mark the children would always draw a soaring football. The perfect scores represented, not reading ability, but familiarity with the game. Most extraneous elements fail to show in classroom testing. They can be detected only by the most painstaking examination and scrutiny of the testing material. Testing must follow upon preliminary critical revision, and further revision must be verified and stimulated by testing. Neither process can be effectively carried on without the other.

#### SUMMARY

1. The law of the single variable declared that, in the comparison of relative attainments, one element, and only one, shall be chosen as the variable to be measured, and other conditioning elements, which might affect the result, shall be held constant. This is a universally accepted principle, which applies to every sort of careful scientific measurement of comparative attainment.

2. Scales for comparative attainment measure quality, difficulty, or amount. These are the three fundamental factors. One of them may be chosen as the variable to be measured. The other

two must be restrained from affecting the results secured. Where it is assumed that one of these three factors is non-operative, the burden of proof rests upon the person making the scale.

3. Reading is a classroom activity which is not readily measurable by scales for quality, or scales for difficulty. It is measurable by scales for amount.

4. There is reason to believe that most classroom subjects may best be measured by scales for quality or for amount. Because of the influence of time and rate, which are not easily controlled, difficulty rarely can be measured directly. It is probable that difficulty will eventually be indirectly measured through series of carefully graded scales for amount.

5. If difficulty and time are to be maintained as constants, the subsidiary elements of difficulty and time must also be maintained as constants. This means that, in the preliminary preparation of testing material, far greater care is necessary than has usually been exercised. In reading, for example, the practice of hastily compiling heterogeneous masses of paragraphs of different lengths and arrangements, indiscriminately calling upon the child's ability to do arithmetic, solve puzzles, reason, remember, reproduce, moralize, and imagine, should not be tolerated in the field of educational measurements. The common practice has been to assume that paragraphs on which equal per cents of failures occurred were of equal reading difficulty. Such an assumption is clearly unsafe, unless it can be shown that care has been taken to keep all the difficulties measured genuine reading difficulties. Unless extraneous, non-reading elements have been weeded out, paragraphs of equal reading difficulty may result in totally different percentages of failures; and so, conversely, paragraphs of different reading difficulties may result in identical percentages of failures. Equal difficulty cannot be secured merely by testing and computation. It can be arrived at only through keen inspection, merciless criticism, and the rigid determination to eliminate every alien influence which might pervert the findings, and result in mongrel scores. The law of the single variable must be conscientiously followed in the writing of every sentence, and the formulation of every paragraph.

## CHAPTER III

### INDIVIDUAL DIFFICULTIES IN SILENT READING IN THE FOURTH, FIFTH, AND SIXTH GRADES

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Two years ago a boy who now ranks slightly above the average of his age-group in general intelligence began his public-school career. He advanced rapidly through the primary grades until the autumn of 1920. At that time it became necessary for him to discontinue regular school work because he was unable to read. In class discussions, in ability to solve problems, and in all phases of school work which did not involve reading he equalled or excelled his classmates.

A careful analysis revealed the fact that the boy had not established the habit of moving his eyes regularly from left to right along a line. At times the first fixation was near the end of the line; frequently it was near the middle of the line; and sometimes it was near the beginning. The remaining fixations were irregular and followed no definite order. Drill exercises were organized which consisted of series of short words typewritten with half-inch horizontal spacing. The boy was required to read these words for five minutes each day in order to cultivate regular habits of eye-movement. That there was rapid reorganization of his method of procedure was clearly evident in his reading. After considerable progress had been made, a simple story was typewritten, again with a half-inch space between words. After a few exercises of this type, the words were grouped in thought units with a half-inch space between each unit. Finally, stories were read, still during the drill periods, directly from books. The facility and accuracy with which he soon read indicated that one of his major difficulties had been corrected. Other prob-



lems, such as increasing the span of recognition, were then attacked. At the present time the boy is making very rapid progress and will doubtless be able to resume work with his class at the end of the first half of the school year.

This case has been cited as an illustration of the failure of regular instruction to meet individual needs. There are doubtless thousands of boys and girls who fail each year and are unable to continue with their classmates because of peculiar defects which could be readily remedied. The results are discouragement, retardation, and elimination in far too many cases.

Progressive schools are taking definite steps to provide facilities for discovering and remedying these defects. The work of Superintendent C. J. Anderson and Elda Merton in the public schools of Stoughton, Wisconsin, is described in the *Elementary School Journal*, May and June, 1920. The work which has been carried on in the Elementary School of the University of Chicago is described in *Reading: Its Nature and Development*, by Charles H. Judd. The valuable results which have been secured in public-school systems such as Stoughton, Wisconsin, and Rochester, New York, thoroughly justify these recommendations: that Bureaus of Educational Research give special attention to the problem of diagnosis; that a special teacher be provided for each large elementary school to devote her entire time to the problem of testing and instructing pupils who encounter fundamental difficulties in reading and other subjects; and that classroom teachers be instructed in the technique of recording facts in order that special difficulties may be discovered and corrected as early in the child's school career as possible.

The cases which are described in the sections which follow illustrate in a limited way the wide variety of difficulties which pupils encounter in silent reading in the middle grades. Each of these pupils was retarded in reading because of a peculiar difficulty. When appropriate remedial devices were employed, each responded satisfactorily to treatment. The purpose of the discussion which follows is to present a limited number of interesting cases, to describe the methods of treatment, and to stimulate supervisors and teachers to cooperate actively in similar studies. Improved meth-

ods of group instruction will do much toward increasing the ability of most boys and girls to read and to study independently and effectively. We shall learn how to meet the needs of pupils who encounter unusual difficulties only through detailed, accurate studies of individual difficulties and application of appropriate remedial devices. Progressive teachers and supervisors can make studies of very great value in this connection.

A FLUENT ORAL READER IN THE FOURTH GRADE WHO COMPREHENDED  
VERY LITTLE READ SILENTLY<sup>1</sup>

This pupil was a fourth-grade girl who was described by her teacher as slow and indifferent. When given the Gray Oral Reading Test in December she made a score of 41.25, which is 5.75 below the standard for her grade. In the silent-reading test she made unusually slow progress and was unable to reproduce what she had read or to answer questions. Evidence that she read all of the words was secured from noting her lip movements.

Tests were next given to determine the ability of this girl to read the materials ordinarily assigned in the reading class. A passage from page 57 of the *Merrill Fourth Reader* was used in this connection. The girl was instructed to read the selection silently for the purpose of getting the thought well enough to reproduce it later. She read at the rate of 1.05 words per second. She reproduced more or less inaccurately only a very small percentage of what she had read. Her lip movements were very pronounced. She answered only one of the eight questions asked and that inaccurately.

To discover if mechanics of reading was causing the difficulty, she was asked to read the same material orally. She read fluently and with expression at the rate of 1.01 words per second, making only four errors. After studying carefully all the data which had been secured, the following conclusion was reached in regard to her difficulties: "Knowledge of the rudimentary mechanics permitted her to read material far beyond her comprehension. She read

<sup>1</sup> Reproduced in part from "Remedial Work in Reading, Part I." By C. J. Anderson and Ella Merton. *The Elementary School Journal*, May, 1920: pp. 687-692.

words as names and not as symbols of ideas. The problem was plainly that of training her to read for content."

The remedial exercises consisted of passages cut from second- and third-grade readers. The first passage was very short and contained few ideas. Each succeeding passage was somewhat longer and made increasing demands on the reader in order to get the meaning. When exercises were assigned, the attention of the subject was directed to meanings rather than pronunciations. "After she had given a reproduction of the 'story' and had answered a number of specific questions about it, she was asked to re-read the selection in search of any thoughts she had overlooked during the first reading. She then gave a second reproduction. This last reproduction was, no doubt largely a result of the specific questions. Nevertheless, it was valuable in training the pupil to see the richness of content in the selection."

The training period lasted for six weeks. One thirty-five-minute lesson was given each week with the exception of one week in which two lessons were given. From five to seven paragraphs were assigned at each lesson in accordance with the methods described in the preceding paragraph. In May the oral- and silent-reading tests were given again. A comparison of the December and May records led to some interesting observations. It is to be noted that there is no change in the rate, but the quality shows a decided improvement. Her score in this test rose to 50, which is 3 points above the standard for her grade. This improvement is significant when it is remembered that no instruction was given in oral reading in these special-help periods.

TABLE 1  
PROGRESS IN RATE AND QUALITY OF SILENT READING

Selection	Words per Sec. Before Practice	Words per Sec. After Practice	Quality Before Practice	Quality After Practice		
				Repro- duction	Questions	Quality
"Tiny Tad" Grades II and III.....	1.11	1.81	0	32	60	46
"The Grasshoppers" Grades IV, V, VI.....	1.05	1.21	0	7	80	18

Table 1 gives the silent-reading records for December and May. It shows a decided increase in silent reading rate and in quality.

In December she was unable to reproduce a single thought or to answer a single question. In May she showed marked improvement along both lines and had become fairly efficient.

A FIFTH-GRADE PUPIL WHO READ SLOWLY BECAUSE OF WORD  
DIFFICULTIES<sup>2</sup>

Pupil G was a fifth-grade girl who read very slowly and ineffectively. Her fourth-grade teacher described her as "a slow reader who reads hesitatingly and haltingly, repeating words and phrases." In the preliminary study of her difficulties photographic records were made of her eye-movements while reading. Oral and silent-reading tests were also given. In the oral reading test the pronunciation of unfamiliar words caused much difficulty. The rate of silent reading was unusually slow, being six-tenths of a word slower per second than her oral-reading rate. The photographic records showed clearly that she "could not unravel the intricacies of the printed lines which proved easy to her classmates." A careful analysis of all of these facts made it evident "that her difficulties were due to a lack of familiarity with printed words and a lack of method of working out new or unknown word forms."

"In an effort to help her overcome this handicap she was given various types of training during eighteen weeks. The first six weeks were devoted to a great deal of oral reading. The second six weeks were spent on drills in phonics and in word analysis. During the last six weeks silent reading was emphasized. While each period of six weeks thus stressed some one phase of reading, all three types of work were carried along throughout the eighteen weeks. For example, oral reading was continued with less emphasis during the last twelve weeks."

During the first six weeks the oral-reading exercises were conducted in ways familiar to most teachers. The selections for reading were made along the line of the pupil's school interests in history and geography. Records of rate and accuracy were secured at frequent intervals for purposes of comparison. The improvement made by the girl in rate and accuracy of oral reading during the eighteen weeks is shown in Table 2.

<sup>2</sup>"Reading, Its Nature and Development," by Charles H. Judd. *Supplementary Educational Monographs*, Vol. II. No. 4 (July, 1918), pp. 82-91.

TABLE 2  
PROGRESS IN RATE AND ACCURACY IN ORAL READING

Period	Words per Sec.	Errors per 100 words
First six weeks.....	2.4	4.5
Second six weeks.....	2.5	2.1
Third six weeks.....	2.7	1.1

"Phonics and word analysis were emphasized during the second six weeks. Various systems of phonics, with some modifications to suit the particular needs, were used. Words mispronounced in oral-reading lessons were worked out phonetically, and lists of words similarly pronounced were built up and reviewed from time to time. There seemed to be a gradual growth in ability to attack an unfamiliar word. In the earlier period the pupil frequently looked at the word helplessly or pronounced a known syllable, but was unable to attack it at all phonetically. She usually asked the instructor to pronounce it. Later, she began immediately to sound the new word phonetically, and though sometimes making a mistake in the length of the vowel or in the position of the accent, her manner of attack indicated that she had confidence in her own ability to work it out." The records which were secured from time to time showed clearly that there was a reduction in the number of mispronunciations, even though the selections which were used gradually increased in difficulty.

"Silent reading was emphasized during the last six weeks, after some training in silent reading had been given throughout the first twelve weeks. For special training, paragraphs or selections dealing with topics of particular interest to the pupil were used. In many instances, the original selections were edited, and the words which had been used in the phonic exercises were woven into the text. Frequently, before the silent reading began, a question was raised the answer to which was to be found in the text. Oral or written reproduction or a discussion of the thought of the selection usually followed the reading. It is interesting to note in passing that, though no effort was made to reduce the vocalization so perceptible at first, it entirely disappeared except when an unusually difficult passage was encountered." The records for rate and comprehension in silent reading which are summarized in Table 3 indicate clearly the value of the special training.

TABLE 3.

PROGRESS IN RATE AND COMPREHENSION IN SILENT READING		
Period	Words per Sec.	Comprehension
First six weeks.....	2.4	22 percent.
Second six weeks.....	3.4	60 percent.
Third six weeks.....	3.6	74 percent.

At the end of eighteen weeks the oral- and silent-reading tests given before the practice period began were repeated. A second pupil who had received no special instruction also took the same tests both before and after the training period. "By comparing the records of the two pupils it is seen that the special Pupil G made a net gain of .63 in oral rate and 2.5 in silent rate. Furthermore, she is beginning to establish a silent-reading rate, while the second pupil continues to read silently at the same rate as she does orally. The gain made by Pupil G in rate of silent reading is even more significant when it is remembered that her silent rate was less than her oral rate of reading before practice began. The gain in comprehension, while not striking, places Pupil G at a normal level for the grade, while the other student is still below average."

#### A FOURTH-GRADE PUPIL WHO READ SLOWLY AND INEFFECTIVELY BECAUSE OF WORD-BLINDNESS<sup>3</sup>

The subject of this study was a fourth-grade girl nine and one-half years old. At the time the study began she was unable to read and could not carry her school work without the aid of a tutor. "The child had been in the University Elementary School for two years, including the first grade, and had therefore received the ordinary instruction in reading, which included a considerable amount of sight reading in which phonetic analysis is also emphasized. In addition to this, the child had been instructed for a year by a tutor, and this instruction had included a very large emphasis on phonetic drill. Moreover, in her second year she had been given special help in reading by her teacher. In spite of all this intensive training, the child, when first seen, was unable to read a primer as well as is a first-grade child before the end of the year."

<sup>3</sup>"Clinical Study as a Method in Experimental Education," by Frank N. Freeman. *Journal of Applied Psychology*. Vol. IV, 1920; pp. 126-141.

Before the child was brought to the laboratory she had been tested with the Gray Oral Reading Test and the Courtis Silent Reading Test, No. 2, and had failed to score in each test. At the time of the examination she was tested with the Gray Silent Reading Test for second- and third-grade children. She read at a rate of 0.5 words per second, and her comprehension score was 23. The average rate for the second grade is 1.96 words per second, and the comprehension score is 25. In order to equal the comprehension standard of second-grade pupils, the girl had to read at one-fourth the standard rate.

Photographic records of the eye-movements of the girl were then secured and analyzed. A highly irregular and unusual condition was discovered. "Instead of going forward step by step, it [attention] skips about, sometimes jumping to a point ahead of where it should be and at other times moving backward over the part which has already been read. This irregularity is in all probability due to the child's failure to grasp the meaning of the words which were fixated by the eye. Failure to grasp the meaning results in the return of the eye to the parts already fixated and in a slow wandering movement or a succession of movements made at short intervals rather than a series of clear-cut movements just long enough to cover the space which can be fixated at a single pause."

In addition to the tests just described a general mental test was given and also other tests which related more or less closely to reading and to speech processes. Among these tests was a test of the recognition of visual symbols, the Binet Picture Test, and tests which included the matching of geometrical forms, the pronunciation of nonsense syllables, and the spelling of simple words. As a result of the diagnosis it was concluded that there was no deficiency in general intelligence, that the child's vision was entirely normal, and that there was no general motor deficiency or language disturbance. The data showed that the difficulty was a highly specialized one and consisted in an inability to make the association between the visual symbols and the sounds of the words. Furthermore, the conclusion was reached that "for this child, at least, phonic drill had been carried beyond the point where it was use-

ful. Instead of being the means to the recognition of word meaning, it had become an end in itself, and really blocked the recognition of the meaning. The treatment, therefore, had as its first object the short-circuiting of this round-about association and the attempt to develop a more direct association between the sight of the words and their meaning."

Early in the training, easy reading material was selected and the child was encouraged to read the passages for their meaning. In this connection, however, difficulty was encountered because the child had not developed coordinated eye-movements or a regular progression of attention. It became necessary, therefore, to restrict her reading of larger units for some time and to direct her attention specifically to each part that she read. Various devices were employed in this connection. (1) Passages were broken up into sentences, and the child read these one at a time from slips of paper on which the sentences had been typewritten. (2) A card was sometimes placed on a page and moved forward across the line as rapidly as the child read. (3) Flash card exercises were given and some use was made of printed directions to which the child responded by appropriate action.

"In addition to these drill devices the child was given continuous reading material which at the beginning was very easy. This was for the purpose of encouraging fluency without the loss of meaning. The difficulty of material was advanced as rapidly as the child could go, and a certain amount of work was also given with still more difficult material because of its inherent interest to the child. Comparatively brief periods of intensive work with difficult material were found to be stimulating and to be helpful in carrying her to a higher level of recognition than was habitual." Parallel with this specific instruction there was practice in spelling and in writing words and sentences. Furthermore, a great deal was done to direct the child's attention to the meaning of what was read. Before assigning a passage, the topic was discussed and the child's curiosity in it was aroused. Difficult words were also written on the board and studied in order to avoid the habit of slurring over unknown words or of pausing too long to study them.



After about eight weeks of training the pupil was tested again. In the Gray Oral Reading Test she made a score of 36.25 as compared with complete failure at the beginning of the training period. This represents the equivalent of a year and one-half of progress. In the Courtis Silent Reading Test she read 3.2 words per second. This is six times as rapid as the rate of reading at the beginning and equals the standard for the sixth grade. The number of questions answered in the time allowed was 34, which is half way between the standard for the fourth and fifth grades. The index of comprehension was 62, which is between the standards for the second and third grades. After the results had been carefully analyzed, it was evident that specific training for one-half hour each day had resulted in progress "equivalent to perhaps three years' ordinary progress in school."

A FIFTH-GRADE PUPIL WHO READ SLOWLY BECAUSE HE RECOGNIZED A  
VERY SMALL UNIT AT EACH FIXATION<sup>4</sup>

Frequent tests and observations revealed the fact that this pupil read very slowly. An analysis of his difficulties showed clearly that he did not recognize words in groups or thought units. In order to provide training in the rapid recognition of groups of words, eight phrase books were prepared in which a phrase was pasted on each page. The first book contained ten very simple phrases cut from a primer. Each succeeding book in the series contained a similar number of longer and more difficult phrases. The eighth book contained phrases from a sixth reader. In conducting drill exercises the teacher flashed each page so quickly that the pupil had time for only one fixation. As soon as a phrase had been exposed, the pupil immediately told what he had seen. A grade of ten was given for each entirely correct response. Since each book contained ten phrases, the scoring was very simple.

The record of the progress through six books in fourteen lessons is shown in the following table. As a rule thirty phrases were presented each day; occasionally, the drill was limited to

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<sup>4</sup>The record of this case was supplied by Miss Elda Merton, Stockton, Wisconsin. It was secured from the progress book of Miss Edna Burull, teacher of fifth and sixth grades, Central School.

TABLE 4  
PROGRESS IN PHRASE RECOGNITION

Book I Lesson Score		Book II Lesson Score		Book III Lesson Score		Book IV Lesson Score		Book V Lesson Score		Book VI Lesson Score	
I	90	II	60	V	60	VIII	60	XI	50	XIV	60
	100		60		70		80		80		70
			70				80				90
II	100			VI	80			XII	80		
		III	80		90	IX	80		90		
			80		90		90	XIII	70		
							100		100		
		IV	90	VII	90						
			100		100	X	100	XIV	100		
		V	100	VIII	100		90				
						XI	100				

twenty; sometimes it included forty. A given book of phrases was not discontinued until the boy had scored 100 in two successive lessons. For illustration, Table 4 shows that a score of 100 was made the second time the phrases of Book I were presented. Drill was discontinued until the next day. On repeating the exercise a score of 100 was again made. Book II was then begun and the exercise was repeated seven times before a perfect score was made. At the conclusion of an exercise the pupil was shown his score. (A score of 90 means that 9 out of 10 phrases were correct.)

TABLE 5  
PROGRESS IN RATE OF READING

Lesson.....	I	II	III	IV	V	VI	VII	VIII	IX	X	XI	XII	XIII	XIV
Words per min	60	69	70	79	80	86	86	70	80	95	90	98	100	105

At the close of each lesson the boy was given a selection from his reader and allowed to read for one minute. His rate for each lesson is shown in Table 5. The entries in the table indicate clearly that the drill exercises proved effective in increasing his rate of reading.

#### A SEVENTH-GRADE PUPIL WHO RANKED LOW IN COMPREHENSION BECAUSE OF A SMALL VOCABULARY OF MEANINGS<sup>5</sup>

This seventh-grade boy was fourteen years, ten months, old when the training began. In the report of his case he is described as follows: "In general school standing he is rated as a poor

<sup>5</sup>"Reading, Its Nature and Development," by Charles H. Judd. *Supplementary Educational Monographs*, Vol. II, No. 4, July, 1918, pp. 106-118.

student, although he is given a grade of good (B) in the manual arts, music, and physical training. In all other subjects he is poor. During the past two and a half years he has received no grade higher than C in history, geography, science, literature, composition, and grammar. In this connection it is interesting to note that progress in these subjects after the fourth grade is dependent to a large degree on ability to get thought from the printed page.

"His teachers report him as a shy, timid boy, easily embarrassed, lacking in self-confidence and initiative in the classroom, though very energetic and responsive on the athletic field. He rarely takes part voluntarily in class discussions, and when called on to do so, responds in a few brief fragmentary sentences, badly expressed, but usually containing a thought or an idea on the topic being considered. His English teacher finds great difficulty in getting him to read with any degree of expression, for he makes no attempt to group words into thought units. He reads in a dull, monotonous tone, slurring words and phrases. When asked to tell what he has read, he reproduces a few ideas in short, scrappy sentences, for apparently he makes few associations as he reads. His teachers in history and geography explain his poor standing in their subjects as attributable to an inability to get ideas from the text. He apparently reads as rapidly silently as any in the class but gets and retains less of the thought."

Tests in oral and silent reading were given which revealed other very interesting facts. He read aloud fairly rapidly, pronouncing the words mechanically and enunciating poorly. Periods were disregarded and adjoining sentences were read as a single unit of thought. The test in silent reading showed that this boy ranked below the poorest readers in the two preceding grades in comprehension. This result supported the judgments of his teachers of history and geography. A review of all the facts which were secured led to the conclusion that he had acquired ability to pronounce words which exceeded very much his ability to understand their meanings.

This diagnosis emphasized the importance of taking steps at once to develop a background of meaning as a basis for intelligent interpretation. "Because of his interest in animal stories and tales

of camp and pioneer life emphasis was laid throughout the eighteen weeks on literature dealing with these topics. The *Boy Scouts' Manual*, Custer's *Boots and Saddles*, Roosevelt's *Winning of the West*, Southworth's *Builders of Our Country, Book II*, the Merrill and the Horace Mann *Fourth Reader* and *Fifth Reader*, Burrough's *Stickeen*, Coffin's *Boys of '76*, and Seton Thompson and Kipling stories, and similar literature were drawn upon freely. Silent reading was continued throughout the eighteen weeks, but was especially emphasized during the first six weeks and again during the last six weeks. After reading a selection the pupil reproduced it orally or in writing. These reproductions at first were so meager and inadequate that he frequently had to re-read several times before he could answer the questions raised. Many selections were read in this way, paragraph by paragraph, and the main points jotted down to assist in the organization of the thought.

"Before the work had progressed very far it became apparent that definite word study was necessary in order to build up a background of meaning. Words were studied in the context for meaning, and certain ones were chosen for detailed analysis of prefix, suffix, and stem. A stem word analyzed in this manner became the nucleus for grouping together other closely related words more or less familiar to the pupil. The word 'traction' encountered in an article on the 'Lincoln Highway' brought out a discussion of traction engines, their use in plowing, road-building, and trench warfare, why so called, etc. This centered attention upon the stem 'tract.' As its meaning became clear the following list was elaborated:

subtract  
contract  
detract  
attract

distract  
extract  
retract  
contraction

attraction  
distraction  
subtraction  
extraction

"A study of the prefixes in these words gave a point of leverage for attacking the meaning of words containing them. In this type of prefix study only those words were listed whose stems were familiar to the pupil, as, for example:

recall  
reclaim  
rearrange  
regain

rebound  
retain  
reform  
remake

retake  
reinforce  
return  
reframe, etc.

In a similar manner an acquaintance was made with the most common suffixes.

"The meaning of some words was approached by the study of synonyms and equivalent idiomatic phrases. These were, as far as possible, studied in the context and discussed at length to bring out shades of difference in meaning." An "indomitable hero" met in the pioneer tales brought forth the following synonyms and idiomatic phrases:

indomitable  
brave  
courageous  
resolute  
manly

fearless  
heroic  
bold  
daring  
plucky

stout-hearted  
intrepid  
audacious  
defiant  
undismayed

to look danger in the face  
to screw one's courage to the sticking-point  
to take the bull by the horns  
to beard the lion in his den  
to put on a bold front.

The type of training which has been described continued throughout the first six weeks. It was supplemented by incidental word study during the remaining twelve weeks of the training period. Oral reading was given special emphasis during the second six weeks and continued during the following six weeks. Inasmuch as this type of training is not directly relevant to the special problem under consideration, it will not be discussed here in detail. Suffice it to say that the special training given in this connection resulted in a 50 percent reduction in error and a gain in rate.

In order to determine somewhat accurately the result of the special training given to this seventh-grade pupil his progress in both oral and silent reading was compared with that of another poor reader in the same grade who did not receive special training. Both pupils made more progress in silent reading than in oral reading. The boy who received special training developed a higher rate in silent reading than in oral reading, while the check pupil maintained practically the same rate in both types of reading. In comprehension the subject of the experiment made far greater progress than the check pupil, although at the close of the experiment he was still behind the standard for his class.

In conclusion the following interesting and significant judgment was expressed in regard to the value of this type of training: "The training of this pupil has apparently affected the mechanical side of his reading very little. His improvement has been rather in the comprehension of what he reads. It seems proper to infer that training in the upper grades, at least training of the type given in this case, is unlikely to be effective in changing the mechanical habits of pupils."

## CHAPTER IV

### THE DEVELOPMENT OF SPEED IN SILENT READING

JOHN A. O'BRIEN

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This article will briefly sketch some of the results obtained from an investigation of factors conditioning the development of speed in silent reading.<sup>1</sup> The investigation was conducted by the writer under the auspices of the Bureau of Educational Research at the University of Illinois.

Huey, Dearborn, Schmidt, Judd, C. T. Gray and others have demonstrated the superiority of silent over oral reading as a thought-getting instrument. They have also pointed out the unmistakable advantages of ability to read rapidly and yet with good comprehension; but how the teacher was to develop in her pupils this desirable habit of rapid silent reading remained for the most part unanswered. Accordingly, this investigation was undertaken primarily to secure an answer to the practical school question: *How can speed in silent reading be increased without decreasing comprehension?*

Among the other queries on which the investigator endeavored to secure data for the formulation of at least tentative answers were the following: Can training to accelerate silent reading rate be developed into methods adapted to pupils under the ordinary conditions of the classroom? How does an increase in speed of reading affect comprehension? In other words, is comprehension thereby decreased, unaffected, or increased? What grades show the greatest susceptibility to improvement in rate? To what extent can the rate be increased by training without causing the reading to degenerate into skimming? What are tentative grade norms for pupils who have been trained in rapid, silent reading? How do such norms compare with the present standards for rate? Is in-

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<sup>1</sup> For a complete statement of the method of procedure, the types of training, the interpretation of results, see: O'Brien, John A. *Silent Reading*. New York: Macmillan Co., 1920. 268 pp.

creased speed effected physiologically chiefly by a decrease in the duration of the fixation-pauses, or by a lessening of their number?

A survey was made of the studies of reading, including both laboratory and classroom investigations, in which any light was thrown, directly or indirectly, upon the factors affecting the rate. The evidence concerning these factors is summarized next.

#### FACTORS IN THE DEVELOPMENT OF SPEED

1. *Practice in rapid silent reading.* The investigations of Peters (12),<sup>2</sup> of C. T. Gray (7), of Miss Bowden (2), of Oberholtzer (11), clearly demonstrate that practice in rapid reading has a marked effect in increasing the reading rate.

2. *The decrease of vocalization in silent reading.* The experiment of C. T. Gray (7), and the observations of Miss Abell (1), of Huey (9), and of Dodge (5), reinforce the conclusion reached by Quantz (13) as a result of his investigation: "the motor tendency (as manifested by lip movement) in any degree has an influence detrimental to rapidity of reading."

3. *Training in perception by means of short exposure exercises, combined with practice in rapid reading.* The experiment reported by C. T. Gray shows the effectiveness of this two-fold type of training.

4. *Familiarity with subject matter.* Dearborn's investigation (4) offers experimental corroboration of the favorable influence of this factor upon the rate—a factor which has obvious *a priori* grounds of plausibility.

5. *Habits of regular, uniform, rhythmical eye-movements.* Fordyce (6) reports the doubling of his speed by replacing his defective motor habits with those "of a regular, rhythmical nature." The observations of Huey (9) and of Dearborn (4) likewise emphasize the influence of these habits of regular, rhythmical eye-movements.

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<sup>2</sup> Numbers in parentheses refer to the bibliography at the close of this article.



6. *Purpose for which the subject matter is read.* The investigations of Whipple and Curtis (16), of C. T. Gray (7), and of W. S. Gray (8), show that the mental 'set,' the mode of attack, the amount of reflective thought, and logical association—all of which influence the rate—depend very largely upon the end for which the reading is done.

7. *Concentration of attention.* The results of the present experiment strongly support the conclusion of Quantz (13) that rapid reading is characterized by an absence of 'day-dreaming' and 'wool-gathering.'

8. *Ability to grasp the meaning of contents.* The observation of Ruediger (14) and the positive correlation generally found to exist between rate and comprehension point to the influence of the central factor of assimilation.

9. *Recognition of the value of the habit of rapid, silent, reading, combined with the determination to acquire this habit.* The cases of Huey, of Fordyce, and of others, show that this factor is of fundamental importance in any attempt to accelerate the reading rate.

10. *The pressure of a time-control.* Preliminary experimentation in this investigation demonstrated that the awareness of a clock accurately measuring the rate, induces a mental 'set' which militates directly against lackadaisical poring and leisurely dawdling and for increased speed in reading.

11. *Individual graph and class chart.* The graphical representation of the individual daily performance, enabling the pupil to see at a glance how his rate compared with yesterday, proved instrumental in arousing in the pupil the strong determination to "make the line go up," to surpass yesterday's record. It stimulated rivalry among the pupils and especially that more wholesome type of rivalry between the pupil and his own previous record. The class chart portraying the median rate of the class for each day, proved a valuable supplement to the individual chart. It enlisted the interest of the class as a whole in the effort to develop speed, and made the pupils enthusiastic to see the class median rise above the record for

yesterday. This earnestness and enthusiasm radiated to all the members of the class, even to the less ambitious, appealed to their class pride and loyalty, and created an *esprit de corps* that was favorable to the success of the experiment. The individual graph and the class chart are devices for motivation. They are applicable, of course, not only to training in speed, but also to other types of work as well. They are included in this enumeration of the factors merely because of their pronounced influence in evoking the type of effort necessary to overcome habits of slow dead-level poring and to build up the opposite type of habits of rapid, effective reading:

12. There are other factors which investigations have shown to have some effect upon the reading rate, such as the size and kind of type, character of paper, and similar typographical considerations. But as factors of this nature are obviously not susceptible to incorporation into types of training to develop speed, they are not considered further.

#### TYPES OF TRAINING

Three types of training were developed. In Type I, practice in rapid, silent reading was made the basic factor; in Type II, the stress was placed coordinately upon the decrease of vocalization and practice in rapid, silent reading; while in Type III emphasis was directed upon training in perception by means of short exposure exercises, supplemented with practice in rapid reading. In Type I all the eleven foregoing factors except Nos. 2 and 3 were incorporated; in Type II, all except No. 3; and in Type III, all except No. 2. All three types of training have much in common—the same auxiliary devices, the same technique. They differ chiefly in the factor which has been made the basic one in each method.

*Type I—Training in rapid, silent reading*—will be outlined briefly, as it is typical of the general procedure in the other two methods.

The teacher was instructed first to point out to the pupils the advantages of a rapid, effective rate of reading, and to enlist their whole-hearted effort in the attempt to develop such a habit. The method consisted essentially of alternate reading and reproduc-

tion. The reading period was broken into several reading stretches, consisting of 2, 3, or 4 minutes. During each stretch the pupils were instructed to read as rapidly as possible—consistent, of course, with an understanding of what was read. The periods were made quite brief, in order to evoke the greatest possible speed by an intensity of effort which could not be sustained over a longer period. The idea was to break up the old order of eye-movement habits as quickly as possible, and to build into a habit an ocular-motor reaction of a more advantageous type. The short period safeguarded against fatigue, as well as against a relapse into the customary leisurely reading rate. In short, speed was the dominant note in the entire set of directions.

The amount read was quickly determined and marked. The pupil then reproduced what was read—sometimes by free paraphrase, orally or in writing, and sometimes by answers to specific questions based on the text. The reproduction was usually brief. Its function was merely to show both the teacher and the pupil whether the matter was properly grasped. The aim was to devote about two-thirds of the time to actual rapid reading. Interesting, familiar material was preferred. Difficult words were explained beforehand. Whenever thought preparation was deemed necessary, the teacher was instructed to give it briefly. At the end of the total reading period the pupil immediately entered upon the chart his average rate of speed as the record for the day.

In *Type II the conscious effort to decrease vocalization* was added to the above group of factors. To secure uniformity in the application of the training and in the method of control, a representative from each of the schools was brought to the University of Illinois to witness a demonstration of the method by a teacher and her class from a Champaign public school.

#### STATEMENT OF PROCEDURE

To test the efficacy of the first two types of training, they were applied to the pupils in 40 classes and 18 elementary schools in 9 cities in Illinois. One was a parochial, the rest were public schools. In these classes there was a total of approximately 1200 pupils.

Because of the lack of a tachistoscope suitable for class use, Type III—short exposure exercises—was not applied to the subjects in this particular experiment. The methods were used in Grades III to VIII, inclusive.

The length of the reading period for all the grades was 30 minutes. Each class was divided into two groups whose aggregate scores in rate, as determined by the Courtis Silent Reading Test, No. 2, Form I, were approximately equal. One group received the experimental training and was called the Experimental, or A Group; the other continued the conventional work in reading and was called the Control, or B Group.

Besides this group control, an effort was made in the present investigation to secure a more refined type of control. Accordingly, each class was further subdivided into pairs of pupils of approximately equal speed in reading. One member of each of the pairs was placed in the experimental, the other in the control group. This afforded a control not only for the experimental group as a whole, but also for each individual member in the group. This enables a comparison to be instituted, not only between the final aggregate scores of the experimental and the control groups, but also between the final achievements of each of the members in the series of pairs. It thus enables one to penetrate behind the group totals to determine the number of pupils in each group who surpass their corresponding control mates. This method of individual control necessitated the elimination from the final statement of results, of the records of the pupils who could not be properly matched. The total period of training extended from April 8, 1919, to May 29, 1919, a period of 39 school days. At the middle and at the end of the training period, the Courtis Silent Reading Tests No. 2, Forms 2 and 3, respectively, were administered to all the classes to determine how much improvement in speed and comprehension had been effected in the first half of the training period and how much in the latter half. The tests were also given to the control groups at the same times in order to secure a check for each half of the training period.

## STATEMENT OF RESULTS

The development of speed effected by the experimental training in Grades IV to VIII, as compared with the progress made by the control pupils, is shown in Table 1. Because of the comparatively small number of third-grade pupils—there were but 32—their records are not included in this table. In this grade, however, the average gain in rate of the experimental pupils is slightly more than twice the average gain of the control pupils.

Table 1 shows that the amount of gain increases as the grade advances. At the end of the training the average for the experimental groups rises from 236.4 words per minute in the fourth grade until it reaches 393.0 in the eighth grade. Reducing the average gains in number of words read per minute to a percentage basis, it becomes possible to express the amount of improvement for the experimental pupils in all the grades in a single quantity, 56 percent. The average gain for the control pupils in all the grades is 25 percent. This shows a final average superiority in

TABLE 1

AVERAGE RATE OF READING FOR EXPERIMENTAL (A) AND CONTROL (B) PUPILS AT BEGINNING, MIDDLE AND END OF TRAINING PERIOD, AS DETERMINED BY COURTIS SILENT READING TEST FOR GRADES IV-VIII

Grade	No. of Pupils	Test I		Test II		Test III		Gain		A's Superiority in Gain	
		A	B	A	B	A	B	A	B	In Words	In Pct.
IV	236	155.7	155.1	241.9	189.5	236.4	188.2	80.7	33.1	47.6	31%
V	154	190.7	191.9	265.4	225.6	277.8	222.1	87.1	30.2	56.9	30%
VI	128	197.8	204.4	284.7	235.4	292.6	235.0	94.8	30.6	64.2	33%
VII	206	205.6	202.5	298.5	237.2	321.6	249.7	116.0	47.2	68.8	33%
VIII	92	220.8	211.7	361.2	290.5	393.0	301.8	172.2	90.1	82.1	35%

Average gain of A for all grades = 56%; of B = 25%; A's superiority over B = 31%.

Table 1 is to be read thus: In Grade IV there was a total of 236 pupils. At the beginning of the training period, the Experimental, or A, pupils averaged 155.7 words per minute, the Control, or B, pupils 155.1; at the middle of the training period, the A pupils averaged 241.9, the B pupils 189.5; at the end of the training period, the A pupils averaged 236.4, the B pupils 188.2; the A pupils gained 80.7, the B pupils 33.1. The superiority in gain of the A pupils over the B pupils was 47.6 words per minute, or 31%.

gain for the experimental pupils over their control mates of 31 percent. In terms of the number of words read per minute the average gain of the A Group is 110.2 as against 46.2 for the B Group—an average superiority in gain of 64 words per minute in favor of the Experimental, or A Group.

As determined by the method of individual control, the effect of the training upon the rate may be seen from the following comparison of the scores of the experimental and control pupils. At

TABLE 2

AVERAGE COMPREHENSION IN READING FOR EXPERIMENTAL (A) AND CONTROL (B) PUPILS AT BEGINNING, MIDDLE, AND END OF TRAINING PERIOD, AS DETERMINED BY COURTIS SILENT READING TEST

Grade	No. of Pupils	Test I		Test II		Test III		Gain		A's Superiority in Gain
		A	B	A	B	A	B	A	B	
IV	236	77.4	78.6	81.2	78.0	81.6	79.1	4.2	0.5	3.7
V	154	82.5	86.3	87.0	89.9	85.6	88.6	2.9	2.3	0.6
VI	128	91.0	92.6	90.8	90.4	88.2	88.5	-2.8	-4.1	1.3
VII	206	91.2	91.8	94.1	93.5	92.8	91.4	1.1	0.1	1.0
VIII	92	95.8	96.5	94.3	96.3	94.8	94.1	-1.0	-2.4	1.4

Average gain of A for all grades = 0.9%; of B = -0.7%; A's superiority over B = 1.6%.

Table 2 is to be read in the same manner as Table 1.

the end of the training period the results for all grades combined were: One pair of pupils had scores identically equal; 86 controls were superior to their correspondents in the experimental group, but 314 experimentals were superior to their controls—a final net superiority of 228 pairs for the experimentals. Subtracting from this total the amount of A's initial superiority of 48 pupils, the results show a final superiority in gain of the experimental over the control group of 108 pupils, or 45 percent.

The effect of the training in speed upon comprehension, as determined by the Courtis Index, is presented in Table 2; as measured by the number of questions correctly answered, the effect upon comprehension is shown in Table 3. In regard to the effect of the training in speed upon comprehension, the result of the application of the method of individual control shows a final superiority in comprehension of 32 pairs, or 8 percent, for the experimental pupils over their controls.

The results of the method of individual control, it will be seen, serve as a powerful reinforcement of a refined type of the conclusions issuing from a comparison of the aggregate scores of the two groups. This method of control shows furthermore that the superiority in rate of the experimental group over the control

group is not due simply to a very marked superiority of a comparatively small number of pupils, but that the superiority is spread very largely throughout the whole group.

### INTERPRETATION OF RESULTS

#### A. The Effect of the Training Upon the Rate of Reading

The data contained in Table 1 are shown graphically in Fig. 1. The latter clearly shows the differences in amount of improve-

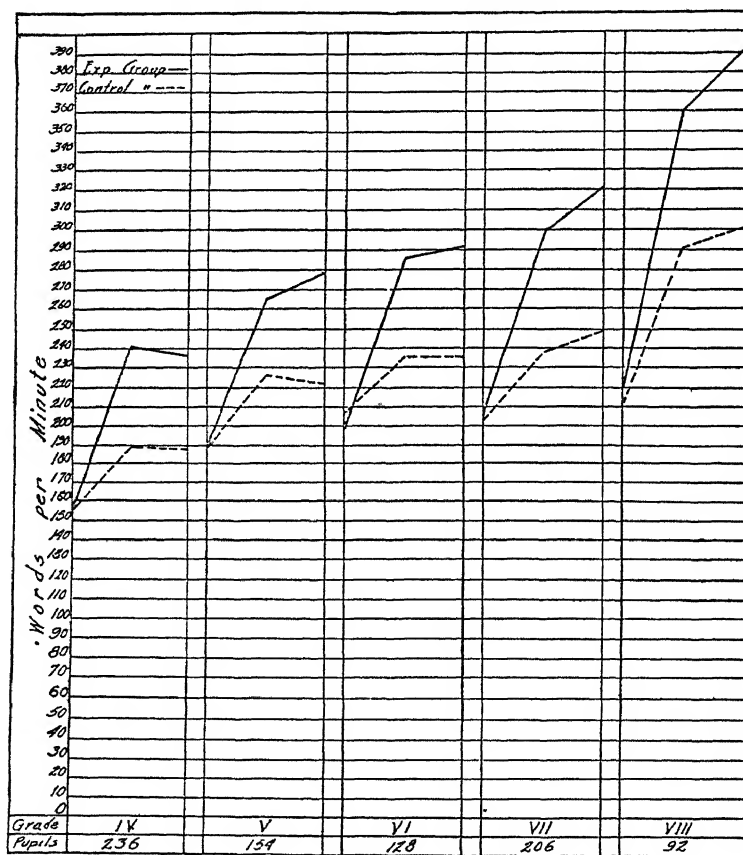


FIG. 1. AVERAGE RATE OF READING FOR EXPERIMENTAL (A) AND CONTROL (B) GROUPS BY GRADES AT BEGINNING, MIDDLE, AND END OF TRAINING PERIOD, AS MEASURED BY THE COURTIS SILENT READING TEST.

ment in reading rate achieved by the experimental pupils and the controls. While in every grade the two groups start at practically the same level of reading rate, yet in every grade the experimental pupils far outstrip the controls. The bulk of improvement, it will be noticed, is effected in the first month of the training. With the exception, however, of the fourth grade, in which there occurs a very slight decrease, improvement of a lesser character continues during the second month. It is to be noted that the increases in speed are very marked. Thus, the pupils in the seventh grade are able to increase their rate 116 words per minute, while the eighth-grade pupils succeed in almost doubling their rate—reaching the high average of 393 words per minute.

These quantitative results would seem to justify three conclusions:

1. *The present average rates in silent reading in Grades III to VIII are needlessly slow and inefficient.*

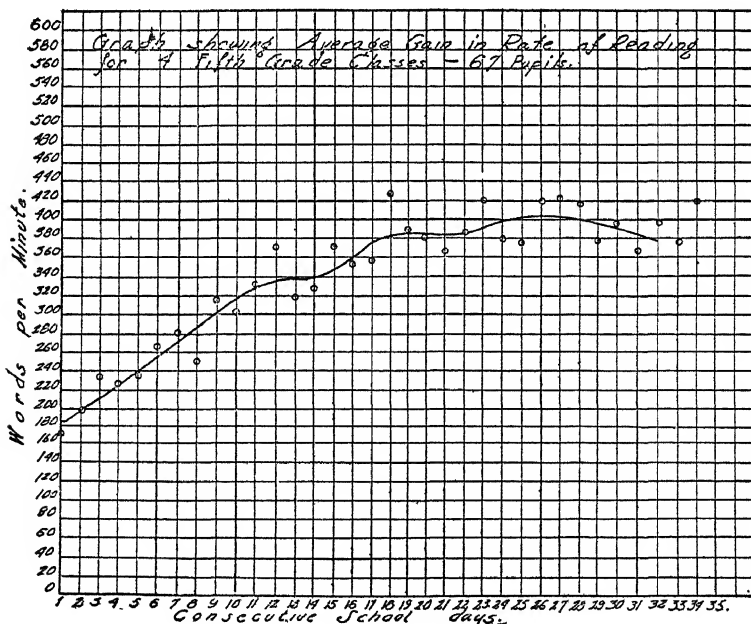


FIG. 2. GAINS IN AVERAGE RATE OF READING FOR FOUR FIFTH-GRADE EXPERIMENTAL GROUPS, BY DAYS, AS RECORDED ON DAILY CLASS CHARTS



2. *These rates can be greatly increased by systematic training extending over a period of two months.*

3. *The improvement effected in the first month is considerably greater than that effected in the second month of training.*

Besides the Courtis Test, the growth in speed of reading was also measured by the daily class chart, which shows the median rate of reading for each day. The fact that the class chart records the progress for each day causes it to reflect the character of the growth in speed, gradual or otherwise, which the three Courtis Tests naturally could not show. Fig 2 reveals the character of the growth in speed as shown by the daily medians of the experimental pupils, totaling 67, in four fifth-grade classes. The dots in the graph represent the actual medians, the line shows the smoothed median increase in speed. The daily class charts reveal an increase in speed greater even than that reflected by the Courtis Test. They serve, on the whole, to corroborate the conclusions based on the scores in the Courtis Test. The growth in speed, it will be noted, is fairly regular, though the bulk of the improvement occurs in the first half of the training period.

#### B. The Effect of the Training Upon Comprehension, as Determined by the Courtis Index

The Courtis index is so computed that it reflects only the accuracy of the response. It does not reflect the efficiency of comprehension as measured by the number of questions correctly answered in a given amount of time. As determined by the Courtis index, the accuracy of the comprehension was not greatly affected, either favorably or adversely (see Fig. 3). It remained constant to a large extent in both the experimental and control groups. The slight superiority in gain that does exist, however, is, in each grade, in favor of the experimental pupils. The conclusions that would seem to follow from the performances of the pupils in accuracy of comprehension in this study are:

1. *Marked increases in speed of reading may be effected without any impairment of comprehension.*

2. *The setting up of habits of rapid reading does not per se increase the accuracy of comprehension.*

3. To secure marked improvement in accuracy of comprehension, special stress must be placed upon training designed specifically to secure that effect.

While the experimental training outlined in this study succeeded in safeguarding and even slightly improving the accuracy of com-

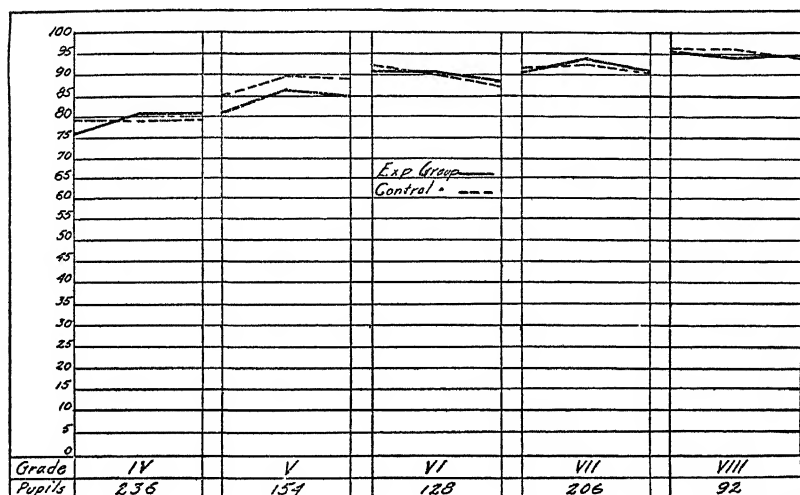


FIG. 3. AVERAGE COMPREHENSION IN READING FOR EXPERIMENTAL (A) AND CONTROL (B) PUPILS AT BEGINNING, MIDDLE, AND END OF TRAINING PERIOD, AS DETERMINED BY COURTIS SILENT READING TEST

prehension, yet its predominant effect was the marked augmentation of the reading rate. To produce such an effect upon the rate was precisely the end for which the training was devised.

#### C. The Effect of the Training Upon Comprehension, as Determined by the Number of Questions Correctly Answered

Efficiency in comprehension is reflected not only by the proportionate accuracy of the response, but also by the number of responses correctly made in a limited period of time. To measure this latter phase of comprehension, the number of questions correctly answered was employed as a supplementary measuring device. The increase in the number of correct answers reflects, furthermore, the increase in the rate of reading of a passage in which the com-

prehension is required and upon which it is tested. This device makes it possible, moreover, to determine whether or not the increased speed of reading effected by the training persisted in different situations. For the mental attitude assumed in reading a passage to answer questions on it immediately, is considerably different from that assumed in reading a passage rapidly simply to 'get the gist' of it. It is thought that the employment of this device in the present study obviates the one serious weakness inherent in the Courtis Reading test. The performances of 274 experimental pupils collected at random from different grades were subjected to this sort of analysis. The results are presented in Table 3.

TABLE 3

GAIN IN COMPREHENSION OF THE EXPERIMENTAL PUPILS, AS DETERMINED BY THE NUMBER OF QUESTIONS IN COURTIS TESTS CORRECTLY ANSWERED

Grade	Number of Pupils	Beginning	End	Gain
IV	97	23.9	34.8	10.9
V	47	29.6	42.1	12.5
VI	57	33.7	48.4	14.5
VII	50	45.3	58.0	12.7
VIII	46	47.1	57.8	10.7

A very marked increase is shown in the number of questions correctly answered by the experimental pupils in all the grades. In fact, the number of *questions correctly answered* by the pupils after receiving the training in rapid reading, is greater than the norms, or the average number of questions *attempted*, as reported by Courtis. The average number of correct answers for the fourth grade, as shown in Table 3, is 34.8 as against Courtis' norm of 30 questions attempted; for the fifth grade, it is 42.1 as against 37; for the sixth grade, 48.4 as against 40. No norms have been suggested by Courtis for the seventh and eighth grades. The average number of questions correctly answered by the different experimental classes at the beginning and end of the training are compared in Fig. 4 with the norms reported by Courtis for the number of questions attempted, whether answered correctly or not.

The conclusions that would seem to follow from this phase of the investigation are:

1. Marked improvement in comprehension, as measured by the number of questions correctly answered, resulted from training in rapid silent reading.

2. This phase of the efficiency of comprehension is measured in no way by Courtis' 'Index of Comprehension,' which is, more strictly speaking, an index of accuracy.

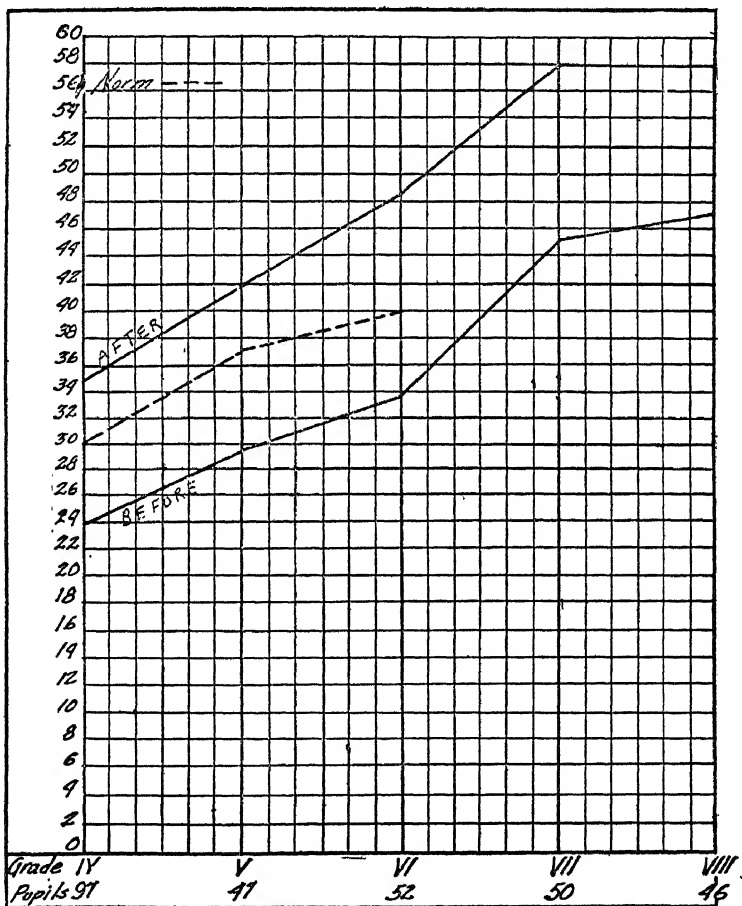


FIG. 4. THE AVERAGE NUMBER OF QUESTIONS ANSWERED CORRECTLY IN COURTIS' SILENT READING TEST BY EACH PUPIL BEFORE AND AFTER TRAINING IN EXPERIMENTAL GROUP. GRADES IV TO VIII COMPARED WITH NORMS REPORTED BY COURTIS

3. *The marked gain in the number of questions correctly answered demonstrates the persistence of the improvement in reading rate in a changed situation involving a different mental attitude, i. e., in careful reading, and reading to answer written questions.*

#### D. The Relative Amount of Gain Made by Different Grades

A comparison of the amount of gain in rate, as determined by the Courtis Test, made by the experimental and control pupils in each of the grades is shown in Fig. 5. This graph brings out clearly the fact that the *amount of gain increases as the grade advances*. In the experimental groups the gain made by the higher grade is in every case superior to that made by the lower. With the single exception of the sixth grade, this is true likewise of the control group.

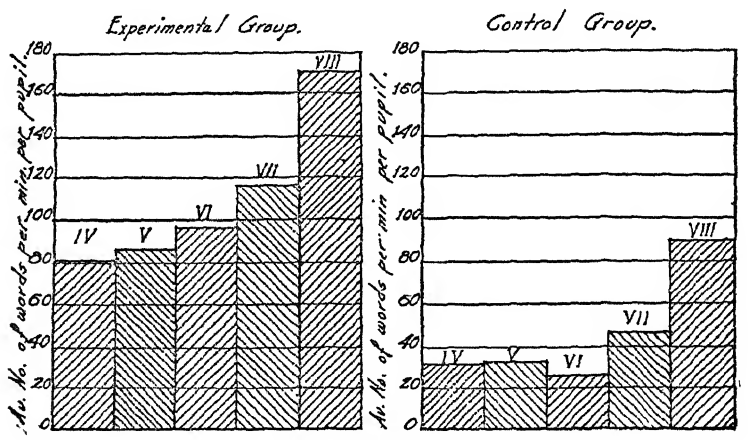


FIG. 5. THE AVERAGE GAIN IN RATE OF READING FOR GRADES IV TO VIII, AS DETERMINED BY COURTIS SILENT READING TEST

The gains in rate made by the different grades were also measured by the daily class charts. The rates of all the grades at the beginning and at the end of the experimental training, as recorded on the class charts, are shown in Fig. 6. The shaded blocks in the figure call attention to the amount of gain made by the different grades. The records of the daily charts, it will be noted, offer a

striking corroboration of the results obtained from the Courtis test. They serve to reinforce powerfully the conclusion illustrated in Fig. 5 that, on the whole, "the amount of gain increases as the grade advances."

This superiority in gain in rate by the upper grades over the lower is quite the opposite of what has usually been reported concerning the relative gains made by the different grades. The third and fourth grades have been of late generally regarded as corre-

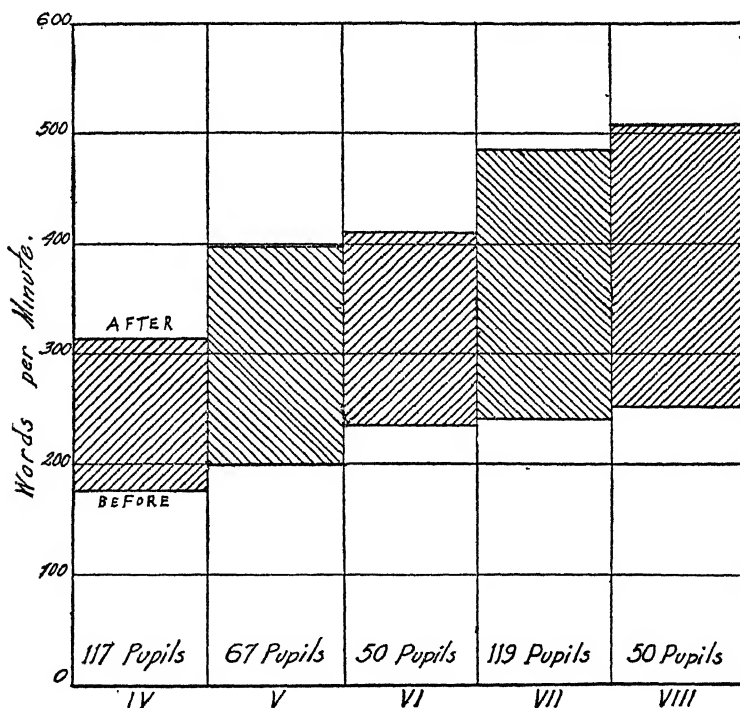


FIG. 6. THE AVERAGE NUMBER OF WORDS READ PER PUPIL BEFORE AND AFTER TRAINING IN GRADES IV TO VIII, AS DETERMINED BY THE INDIVIDUAL CHARTS

sponding to the crucial school periods during which any appreciable increases in rate are to be effected. The results reported by W. S. Gray (8), Judd (10), Courtis (3), and Waldo (15), show that, from the fourth grade on, the rate is practically at a standstill. Thus Waldo reports that, after a year's work in reading,

gains of 2.1 and 11.7 words per minute were effected in the sixth and eighth grades respectively—gains so meager as to be scarcely perceptible.

This difference between the amount of gains in the various grades as reported by the previous investigators and those reported in the present study is due to the fact that the gains previously reported were the results of the conventional type of instruction in reading with almost the entire emphasis upon the oral phase; whereas, in the present study the development of speed was made a conscious problem in the upper as well as in the lower grades. This is in marked contrast to the conventional type of instruction in reading in the upper grades where rate in silent reading is generally completely ignored. From the quantitative results of this phase of the investigation four conclusions would seem to follow:

1. *Marked increases in rate can be effected in the upper grades when speed in reading is set as a definite problem for the pupils.*

2. *When training in rapid silent reading is given to pupils not previously trained therein, the increase in rate tends in a general way to advance pari passu with the advance in the grade; the higher the grade, the greater is the increase in rate.*

3. *As compared with the gains which can be readily effected by systematic training in rapid silent reading, the increases ordinarily obtained in rate in the upper grades are so small as to indicate a condition almost pathological in character. They constitute a serious indictment of the present school régime in the teaching of reading, with its grotesquely misplaced emphasis on oral reading and its utter neglect of reading in the true sense of the term—the silent interpretation of the printed symbols.*

#### E. The Average Rates Attained by Pupils After Training, Compared with Existing Norms

A comparison of the averages of the experimental pupils in Grades IV to VIII, with the results reported by Courtis, Brown, Gray, Starch, and Oberholtzer, and by Courtis in the Gary Survey, is presented in Table 4. There is a common basis of comparison between the averages of the experimental pupils and the norms

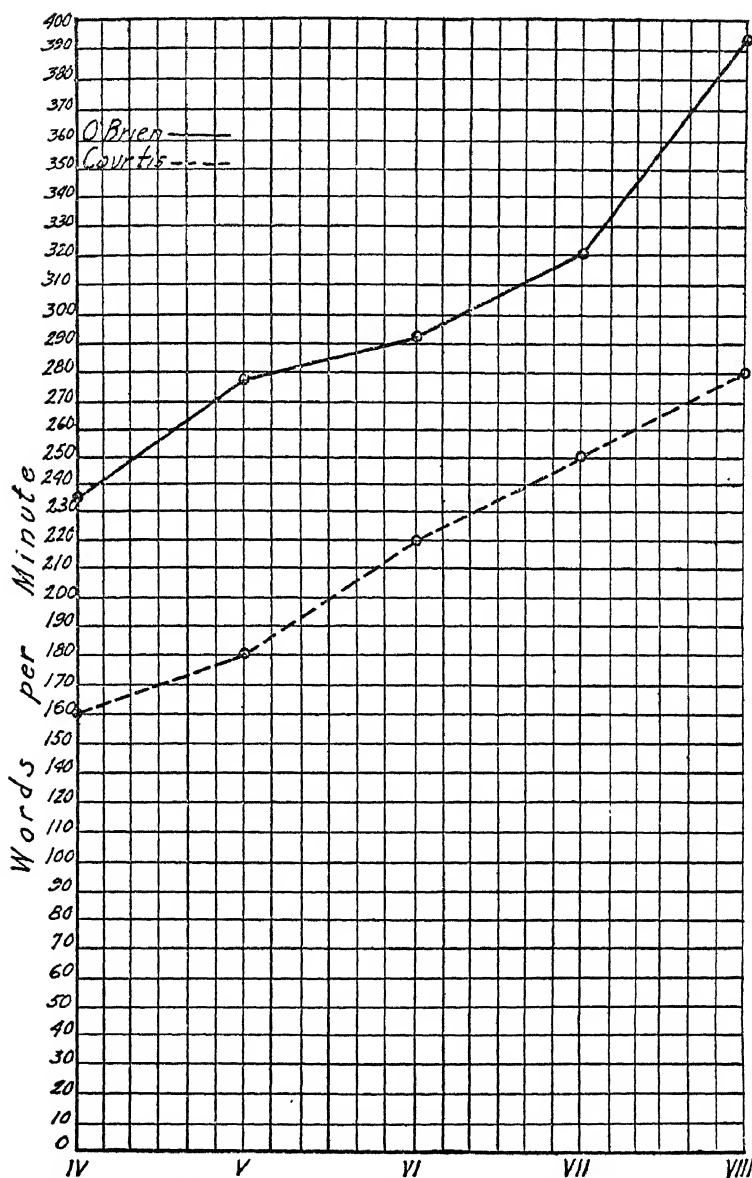


FIG. 7. THE AVERAGE RATE FOR PUPILS AFTER TRAINING IN RAPID READING, AS COMPARED WITH NORMS REPORTED BY COURTIS FOR ORDINARY READERS



reported by Courtis. Both were based on the Courtis test and the directions to the pupils were in both cases identical. The norms reported by Courtis represent the smoothed averages; the norms presented by the writer are the actual averages. A comparison of these two norms is shown in Fig. 7. This figure brings out strikingly the superiority in reading rate of pupils who have received training in rapid, effective silent reading and pupils who have been nurtured on the conventional pabulum, drill in oral reading. The superiority of the experimental pupils in every grade is very marked. Not less noticeable is the superiority over the norms reported by W. S. Gray and by Oberholtzer, as also shown in Table 4. The norms reported by W. S. Gray for the three different selections in his reading test have been adjusted here to the basis of the easiest selection, "Tiny Tad."

The highest norms reported are those by Brown. They represent, however, not the averages of all the pupils tested in the different grades, as in the case of the other investigators, but the highest averages reached by various single classes tested by Brown. Consequently, they are offered as norms or standards to be striven after,

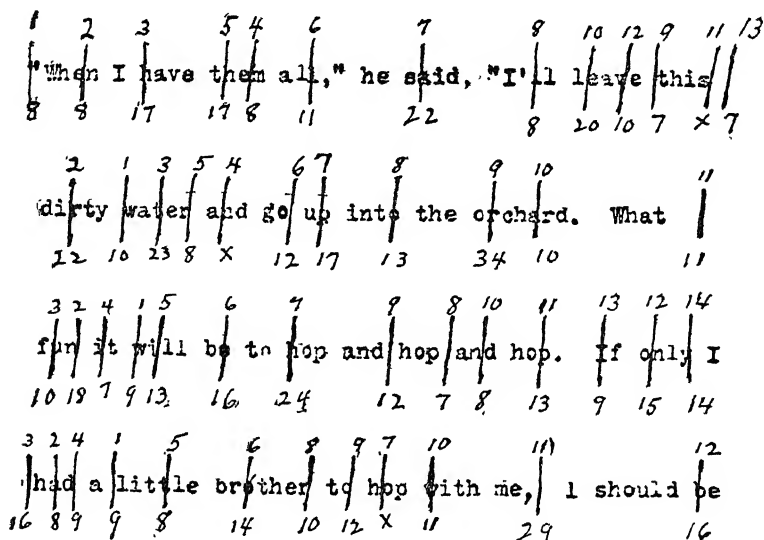


PLATE 1. EYE-MOVEMENT OF FOURTH-GRADE SUBJECT A.P. BEFORE TRAINING.

rather than indices of the present average attainment of the different grades. These standards mentioned by Brown come closer to the averages actually reached by the experimental classes than those of any of the other investigators. They are still, however, very considerably below them, as shown in Table 4.

TABLE 4

AVERAGES IN RATE ATTAINED BY PUPILS AFTER TRAINING (O'BRIEN) COMPARED WITH NORMS OF PREVIOUS INVESTIGATORS

Grade	IV	V	VI	VII	VIII
O'Brien	286	278	293	322	393
Oberholtzer	156	186	234	282	288
Courtis	160	180	220	250	280
Gary	140	166	185	198	204
Starch	144	168	192	216	240
Brown	213	269	272	279	290
Gray	180	204	216	228	234

The previous norms for reading rate have all been derived from the performances of pupils who have been trained in the conventional type of oral reading. In the vast majority of cases they have received no training in rapid silent reading. What the norms will be after the schools begin to train in rapid silent reading is an

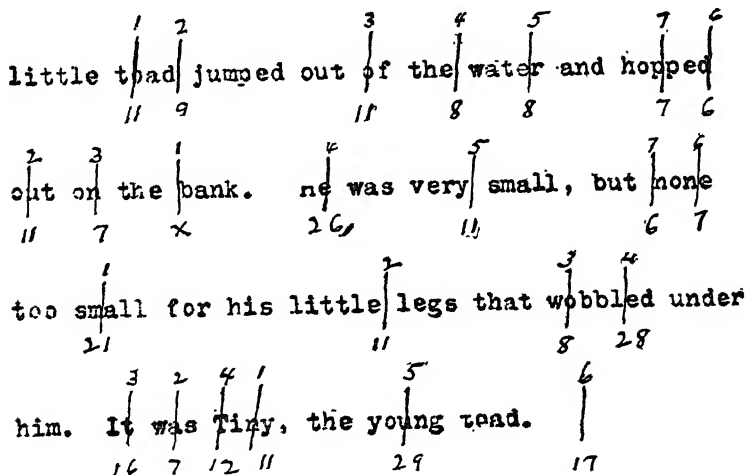


PLATE 2. EYE-MOVEMENT RECORD OF FOURTH-GRADE SUBJECT A.P. AFTER TRAINING.

x indicates that it was impossible to determine with accuracy the duration of the fixation-pause.

interesting question which the future alone can answer. As a result of a pioneering effort in a virgin field, the actual averages attained by the experimental pupils in the different grades in the present investigation are suggested as tentative norms. The degree of reliability of the averages for the different grades has been computed in terms of the P. E. which are presented in Table 5. It is

TABLE 5  
TENTATIVE NORMS FOR PUPILS TRAINED IN RAPID SILENT READING

Grade	Average	P. E.
IV	236.4	12.13
V	277.8	8.37
VI	292.6	8.71
VII	321.6	7.01
VIII	393.0	12.77

noted that the P. E. is relatively small, which indicates a good degree of reliability for the averages.

#### F. Physiological Basis of Development of Speed

Photographic records of the eye-movements of ten pupils in Grades III to VIII were taken before and after the training in rapid silent reading. In each case the pupil developed habits of rapid silent reading. A study of the records showed that the improvement on the physiological side was effected chiefly by a lessening of the number of the fixation pauses rather than by a decrease in the duration of these pauses. Plates 1 and 2 are presented in illustration of this modification of the eye-movement habits. The lines indicate the places of fixation; the numbers at the top show the order of the pauses and those at the bottom, the duration of the pauses in fiftieths of a second. The development of speed was also accompanied by a marked decrease in the number of regressive movements and by the setting up of habits of regular rhythmical eye-movement.

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## CHAPTER V

### MOTIVATED DRILL WORK IN THIRD-GRADE SILENT READING<sup>1</sup>

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The general problem toward the solution of which this study is directed is: what is the value of games and devices in providing motivated drill in the fundamental process of silent reading? Before describing the material and the methods that were employed in this particular experiment with pupils in the third grade we shall discuss some of the theoretical considerations that, in our opinion, bear upon the efficiency of drill work in general.

#### NATURE AND CONDITIONS OF EFFECTIVE DRILL

Drill is the name given to that kind of repeated activity which has for its purpose the increasing of one's physical skill or dexterity or the permanent fixing in memory of certain useful associations. Stated in another way, drill is an activity which has for its purpose the reducing of certain mental or physical operations to an automatic basis.

If drill is to be made effective and economical, it must be freed from some of its monotonous and unattractive aspects. Instead, it must be made attractive, profitable, and varied. Unless this condition is realized to a greater or less degree, drill periods can be scarcely more than periods of drudgery for both teacher and pupils. A feeling of satisfaction should accompany every drill period and a feeling of discontent should follow every unsuccessful effort. It must be quite generally conceded that responses, or reactions, in order to be often repeated, must be pleasant to the performer, and it is equally true that unsuccessful or unpleasant responses tend to

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<sup>1</sup> The study from which this material is drawn was made at the University of Kansas with the co-operation of Dean F. J. Kelly.

be sluffed off or eliminated. One of the chief characteristics of successful drill work is repetition, not meaningless, thoughtless repetition but clear cut, vivid, and interesting repetition. If a feeling of dissatisfaction or annoyance accompanies a series of efforts, it will not be often repeated. Now if this repeated activity is to be voluntarily realized, which, of course, should be the case, only one alternative remains open for the educator; namely, make drill work interesting in itself. Let the results of the activity be an incentive to further effort. Let the process of the development of skill be inviting to the learner. Pleasure brings success, and success spurs the learner on to greater effort, while unpleasant duties or activities have a depressing, retarding effect.

Interest, as used above, does not imply mere fun or entertainment. It does not imply 'taking things easy.' In fact, when teaching deteriorates to this level, interest invariably dies out. Students should be led to see a distinct need for making a process automatic. Once seeing this need, it should serve as an impelling force, being responsible for the expenditure of effort even when the attitude of mind and body is not entirely favorable. If possible, drill lessons should occur when the children see that, without these fundamental, automatic abilities in their school subjects, future progress will be materially handicapped, if not finally arrested. Let the nature of the material presented to children be such that they will really care to master it. Let them enjoy it, let it be a game for them.

Play may be used in school in a very useful way. A child's play interests may be used as a means of bringing about the repetition of those acts which need to be fixed in the mind as habits of thought. In other words, play could be profitably used as a means of making drill interesting. Numerous repetitions of a single activity must of necessity become monotonous to the child unless a motive, like winning the game, for carrying on this activity is provided. Play can with profit enter more thoroughly into the education of children and if we mistake not, the natural play activities of children are capable of furnishing numerous suggestions that can profitably be employed within school walls. Organized games, making use of the child's instinct for play and based on play motives, should form a part of the regular curriculum, especially

during drill periods. Since young children play much, play should be included in their school activities. Much of the unattractive, toil attitude which young children have towards their school tasks could thus be eliminated.

Dramatization is another form of play activity that can be successfully used in the drill work of the lower grades. This fact is especially true in the teaching of reading. Children love to make a situation real by going through the motions it suggests. Abstract ideas are often not comprehended, and the child is not sure of his understanding of the passage read. Allow him to act out or dramatize the idea and it becomes real to him. If it is not thus made real to him, his lack of understanding is shown by his actions, and the teacher has a rather definite means of knowing the abilities and inabilities of her pupils. This means of diagnosis should be useful to the teacher in planning individual assignments and tasks for the future. Let action be the test of comprehension. In other words, learning by doing is a more efficient way of learning than is learning by passive listening.

Again, one is safe in saying that drill is futile when it relies on the device of formal external repetition to achieve results. Instead, there must be repetition with attention. Careless, blundering repetition is valueless from the standpoint of improvement in the desired activity and is a hindrance to the introduction of correct, economical methods of procedure. The teacher should strive to focus the attention of the student on what he is doing and how he is doing it. Exceptions to right methods must be positively discouraged at every opportunity. A child learns to read his lesson intelligently not by fifty or a hundred inattentive readings; rather the most economical method of learning to read requires that the maximum of focalized attention be given during the reading process.

Drill, to be most efficient, must be individual in character. Mass drilling of pupils does not meet the individual needs of the different class members. Class drilling of pupils often gives practice to certain pupils when in fact they do not need it, hence it is often worthless. To be effective in its highest degree, drill should be conducted for each pupil in the light of his particular abilities and



according to his needs. Much group drill work shows little attention given by many of the class members, except as it is necessary, in a parrot-like fashion, to follow the leaders in the work. Such work is doubtless beneficial to the leaders, but it is of little benefit to the others who take part.

#### READING MATERIALS

The fundamental aim in devising reading materials for this study was to have drill work in reading assume the form of a game in which the elements of comprehension of what is read and speed of reading would play a prominent part.

Since the love for activity, or motion, is one of the characteristics of childhood, it was decided to make use of this fact in developing the reading materials for this study. Printed cards containing 'action' sentences which lend themselves readily to dramatization in the schoolroom were devised.

We believe the psychological principles stated in the foregoing paragraphs are fundamental in the teaching of reading in the lower grades of the elementary schools, and the materials, to be described presently, have consequently aimed to bring these principles into the foreground. In determining the content of the sentences which should appear upon these reading cards, the environment, interests, and every-day activities of children as a whole were kept constantly in mind. In order to appeal to the needs and interests of various types of children in the matter of the response to be given, four different kinds, or sets, of cards were devised, which, for convenience, we will call Set A, Set B, Set C, and Set D. These different sets of cards are described in the "Rules for Reading Game," which are given later.

The A, B, C, or D, as the case may be, which appears in the upper left-hand corner of each card indicates to which set this particular card belongs. There are 150 A's, 150 B's, 250 C's, and 100 D's. The cards are arranged serially in order of difficulty (least difficult first, most difficult last), and the number which appears in the upper right-hand corner of each card indicates the position in the series to which this card belongs. For instance, A 125 means that the card belongs to Set A and is the one hundred and twenty-fifth card (based upon the author's judgment) in Set A, in order of difficulty.

A sample card from each of the 4 sets of reading cards is shown below. Each card is 2 inches wide and 4 inches long.

A	125
School closes at four o'clock in the afternoon. Show how the face of a clock looks at that time.	

B	67
A donkey was loaded with salt. He lay down in the water. What happened to the salt?	

C	239
Shetland ponies are little horses which children like to ride. Show how tall a Shetland pony is.	

D	87
Mosquitoes are larger than elephants. Their wings are made of brass and copper.	

In order that the reader may gain an accurate knowledge of the content of the reading materials devised for this study the first 10 cards and the last 10 cards of each set will now be given.

#### SET A

1. Face the rising sun.
2. Lay your book in the nearest window.
3. Place your right foot in front of you.
4. Cover your eyes with your hands.
5. Place your left elbow on a piece of wood.
6. Take three long steps towards the door.
7. Handle your arm as if it were broken and very sore.
8. Stretch both arms out as far as possible.
9. Ask your mother for a piece of bread and butter.
10. Place your right hand on the left knee.
141. Our President is a very good man. It is his duty to see that people obey the laws of the United States. Write his name on the blackboard.
142. Fall asleep and snore loudly. Remain asleep until you think one minute has passed.

143. Act as if you were tired and sleepy by leaning against the wall and nodding your head.

144. Put your left hand against the blackboard. Now take a piece of chalk and mark around your hand so as to make a picture of it on the blackboard.

145. Sit down in your seat, then lean backward until the back of your head strikes the desk behind you.

146. Take a piece of chalk in each hand. Now make two marks on the blackboard just as far apart as you can reach.

147. "Paul Piper picked a peck of purple peppers." Write this sentence on the blackboard. Cross out the letter "p" every time it appears.

148. The vowels of the alphabet are: A, E, I, O, and U. Write "Indianapolis" on the blackboard, then draw a mark through each of the vowels.

149. Snakes crawl on the ground. They haven't any feet. Some snakes catch mice and are useful to the farmers. Draw a picture of a snake on the blackboard.

150. The children played tag on the lawn. They soon felt tired and went to sleep. There were eleven children in the group. Make the figure "eleven" on your paper.

### SET B

1. Name some good winter games.
2. Tell how many boys there are in the classroom.
3. Repeat the names of two pupils that you know.
4. What are shoes and boots made of?
5. Spell the word "rabbit" three times.
6. Name four articles that can be seen in the classroom.
7. Name three things used in cooking our food and heating our houses.
8. Are cows useful to us in any way? If so, how?
9. Name different kinds of animals that may be seen at a circus.
10. Whisper the names of two animals raised on the farm.
141. Clyde went to the barn to gather the eggs. He put them in his cap. He dropped his cap on the hard ground. You tell the rest.
142. Suppose you are lost and cannot find your way to the school-house. Inquire of Mr. Jones which way to go.
143. Mamma had a good dinner. I was playing in the yard under the big tree when she called me. Dinner is eaten about the middle of the day. What is the morning meal called?
144. Milk is sold by the pint and by the quart. A quart of milk is bigger than a pint. How many pints does it take to make a quart?

145. The little girl is pretty. Her hair is black and curly. She is now thirteen years old. How old was she four years ago?

146. The boys went to the woods on Wednesday. They gathered sticks for the fire and cooked their own dinner. What day comes just before Wednesday?

147. Make a sentence out of the words that follow: "eat grass cows."

148. My grandmother lives on a farm. I am going to visit her. I shall see ducks, geese and chickens on the farm. In what way are ducks and geese alike?

149. Hiawatha was a little Indian boy. He lived in the woods with wild animals all around him. Name some wild animals that lived in the woods with Hiawatha.

150. Last year I bought some roses for twenty cents a dozen. How many things does it take to make a dozen?

#### SET C

1. Show how mother rocks the baby's cradle.
2. Lay the football on the floor, then kick it.
3. Act as if you are buttoning your coat.
4. Baby has some sand in his shoe. Loosen the string and pour it out.
5. Act as if you were cutting a piece of cloth with the scissors.
6. Pretend that you are trimming your finger-nails.
7. Aid Mary who is trying to read her lesson.
8. Go through the motions of splitting wood with an ax.
9. Catch the basket-ball. Now toss it back to Henry.
10. Light the lantern and set it on the table.

241. The hoe was left out in the rain and it is now rusty. Papa scoured the rust off with sand-paper. Act as if you were rubbing the hoe with a piece of sand-paper.

242. The wheat was threshed last Saturday. Now it is in a bin in the granary. Charles likes to wade in the wheat. Show how he walks when wading in the wheat.

243. Daniel's new coat fell from the hook on to the floor. When he picked it up, the sleeves were covered with dust. He brushed the dust off with a clothes brush. Show how he did it.

244. A hickory nut or a walnut has a hard, thick, shell. We have to crack them with a hammer. Act as if you were cracking a walnut.

245. The dog can dig a hole in the ground with his fore-paws. He makes a hole in the ground and hides away a bone until he wants it. Show how a dog digs a hole with his fore-paws.

246. You have seen a cat waiting patiently at the hole for a mouse to come out. When Mr. Mouse comes out, the cat springs upon him and eats him. Show how a cat springs upon a mouse.

247. The dog is a swift runner. After he has been running, his tongue hangs from his mouth and he breathes very rapidly. Show how a dog breathes when he is warm and tired.

248. The cat has very sharp claws. She is very active and strong. She can walk so quietly that the mice cannot hear her coming. See if you can walk across the room without making any noise.

249. When papa gets up from the supper table, he gets a toothpick and begins picking his teeth. Pretend that you are picking your teeth.

250. Mr. Wilson is digging potatoes to-day. He plows them out with a big team of mules and a plow. He then puts them in a sack and carries them to the cellar. Act as if you were picking up potatoes.

#### SET D

1. Apples and peaches grow on the ground.
2. Do you like to climb high up in a tree?
3. Do farmers cut oats and wheat in the winter?
4. Does a baker make shoes, boots and slippers?
5. The moon is just ten feet from the ground.
6. Do we know whether kittens have the head-ache?
7. Mamma sews the buttons on my clothes with binder-twine.
8. My hair is green and my eyes and teeth are yellow.
9. The sun is no bigger than the palm of my hand.
10. When it rains the sun is always shining brightly.
91. Horses can gallop very fast. Their hoofs make a noise when they hit the ground. Can you ride in a gallop?
92. Dreams are queer things. They come to us in the night while we are sleeping. Did you ever dream of falling from some high place?
93. Clarence went to bed and his mother blew out the light. The room was then dark and still. Are you afraid in the dark?
94. The grocer sells soap, sugar, and beans. I think he is fair and honest. Would you ask for a dozen beans and a bushel of soap?
95. It is interesting to read story-books. Stories about animals sometimes make us afraid. Did you ever read the story about "Little Red Riding Hood?"
96. Frost makes the leaves turn red and brown. They soon fall to the ground. Are the leaves red and brown now?

97. Houses used to be made of logs. Mud was placed between the logs to keep out the wind and rain. Are houses still built in this way?

98. Hark! I hear the school bell ringing. I must hurry or I shall be late. I do not want to get a tardy mark. School begins a little while before sunrise.

99. A neat-looking boy came to school to-day. His hair was combed and his shoes were polished. Do you think his hands and face were clean?

100. We went to church last Sunday. Uncle John and Aunt Lena came home with us. They took us out riding in the afternoon. Do you enjoy riding in a car?

#### METHOD OF PROCEDURE

The general plan of procedure was as follows: The experiment was carried out with 1,139 children (571 in non-drill sections and 568 in drill sections) in thirty different third-grade rooms. Only third-grade children were used, as the materials were developed with this idea in mind.

1. At the beginning of the study, December 29, 1919, standardized tests in reading (Monroe's Standardized Silent Reading Tests) were given to all the children. These tests revealed the standings or abilities of the children at the beginning of the study. The methods of scoring provided by the authors of the tests were strictly adhered to in every case, both at the beginning and at the end of the study.

2. After these tests were given, the attempt was made to divide the pupils of the thirty different rooms into two groups of equal size and mental attainments. In making this division the advice and assistance of the superintendent of schools was sought. This method of division seemed advisable, as it was desirable to begin the study without delay rather than to wait until all of the papers had been scored and to make the division then upon the basis of the results thus found. The superintendent's judgment in this matter was exceedingly accurate, as will be noted by referring to data in Table 1. A better division of the children into groups of equal size and mental ability could not have been realized even if the division had been based upon the results of the tests.

The division into groups accomplished, fifteen of the rooms were provided with the materials and the teachers were given in-

structions in their use. This was done both by demonstration and by a set of printed rules with which each teacher was provided.

The teachers of drill classes were requested to use the materials 10 minutes a day on Mondays, Wednesdays, and Fridays.

Since the aim was to compare the improvement made by the drill section upon its previous record and the improvement made by the non-drill section upon its previous record, it was quite essential that the same amount of time be spent by each section in improving reading. Therefore, the time spent in the extra drill work by the drill section was deducted from the regular amount of time given to reading improvement. In other words, the time element in the two groups was identical; the only difference was the way in which this time was utilized. In order to leave the working conditions of the drill group as nearly normal as possible, the extra drill work was given during the regular lesson period. The drill classes were to cover the same daily textbook assignments as the non-drill section.

The experiment was in operation from January 1 to April 1, 1920. At the end of the study, as at the beginning, the tests in reading were given to all children. The improvement in rate and comprehension was then determined.

For the purpose of making clear just how the work was actually conducted during the drill period, the rules for playing the reading games are reproduced.

#### RULES FOR THE READING GAME

The reading cards are divided into four main divisions, or sets. Set A is a group of 'Action Cards.' These cards are primarily, simple commands or requests. The child works with things actually present. No pretense is involved. ('Place your right hand on your left knee.') Bodily activity is required in each case.

Set B is a group of 'Language Response Cards.' Response to these cards is made wholly through the medium of spoken or written words. ('Name some good winter games.') Bodily activity is not required. Language responses may be written or oral, depending upon the teacher's judgment as to the needs of the particular group of children in question.

Set C is a group of 'Pretense Cards.' Here the children are asked to *pretend* that they are doing this or that particular thing. They work or pretend to work with things *not* actually present. ('Act as if you were hoeing in the garden.') Muscular activity is required in all cases.

Set D is a group of 'One Word Response Cards.' Response to these cards may be made by using one of the four following words: *Yes, No, Right, or Wrong*. ("Is ten greater than nine?") ("Horses have two feet.")

The cards in each of the four sets have been arranged in order of difficulty, least difficult first. The teacher will do well to keep this in mind in giving out the cards. If a group of children need exercise in giving correct oral or written language responses, they should be given cards from Set B. If children need exercise in accurately getting the thought from the passage read, so that they can with accuracy perform the desired activity, thus giving visible evidence as to their understanding or misunderstanding of the passage read, they should be given cards from Set A or Set C. If children need practice in selecting the correct answer where other answers are possible, they should be given cards from Set D.

#### PLAYING RULES (SET A)

The children are arranged in pairs according to some convenient plan. Each child is given a sufficient number of cards to occupy his time for the entire reading period. If the time allotted to a reading period is fifteen minutes, ten cards given to each child will probably be enough.

For convenience, let us say that Ruth and James are playing together. Each is given (say) ten cards from Set A. Each has a pencil and paper on which to keep the score or his or her opponent. James picks up one of his cards, reads it silently, hands it to Ruth who reads it carefully, then proceeds to perform the required activity. By his performance, Ruth judges whether or not James has gotten the thought of the passage which he has just read. She now gives him a score of "1" if he has performed his task correctly, and "0" if he has failed.

The teacher will do well to be in the midst of the children while the game is in process, to watch the performances of the children being judged and the scoring of the ones doing the judging. Fairness, accuracy, and speed are things to be encouraged.

Ruth now reads one of her cards and James becomes judge. Thus the game proceeds until the twenty cards are exhausted or until the reading period has been consumed. The one having the greatest number of perfect scores (ones) at the end of the play period wins the game.

The rules for playing with cards from Sets B, C, and D are the same as the above directions which are based upon Set A, the only difference being in the nature of the responses given, and these varied responses do not effect the rules for playing.

#### RESULTS

The accompanying table summarizes the results for the fifteen classes of the non-drill section (A to O) and the fifteen classes of the drill section (a to o). The table indicates the scores both for



comprehension and for rate—in each case in such a way as to contrast the January scores and the April scores.

Improvement may be indicated in two ways; increase in the median performance and decrease in the absolute or the relative variability of the class. The table is arranged to show the alterations that appeared in both these respects and for every one of the thirty classes under test.

Disregarding the individual classes and referring now only to the average performance of the drill and the non-drill sections, the following facts appear. Between January and April the non-drill section increased its median comprehension score from 3.9 to 7.0, while its average deviation increased only 3.3 to 3.7 (the coefficient of variability, or relative degree of variation, accordingly, decreased from .84 to .53). Correspondingly, between January and April the drill sections increased their median comprehension score from 4.0 to 9.0, while their average deviation increased from 3.1 to 4.5 (the

TABLE 1  
SCORES IN COMPREHENSION AND RATE OF READING OF 15 NON-DRILL AND 15 DRILL CLASSES IN JANUARY AND IN APRIL

NON-DRILL SECTION	Comprehension				Rate					
	January		April		January		April			
	Class	Med.	A. D.	Med.	A. D.	Med.	A. D.	Med.	A. D.	
	A	4.3	2.7	8.0	4.4	37.5	21.4	57.3	17.2	
	B	3.9	3.9	6.9	3.8	42.1	21.8	50.0	15.4	
	C	3.8	4.0	7.0	3.8	38.8	24.2	46.4	17.6	
	D	3.2	2.6	5.7	4.2	27.8	17.3	40.0	24.0	
	E	3.9	4.7	9.8	5.0	36.9	22.9	57.0	23.0	
	F	2.1	2.6	6.5	3.6	22.5	16.6	47.7	16.4	
	G	6.5	3.7	4.1	3.2	51.6	18.0	42.5	21.0	
	H	1.7	2.8	11.0	3.2	20.0	17.8	56.3	17.2	
	I	4.1	3.4	5.9	2.8	31.3	18.9	33.5	12.6	
	J	3.3	3.3	7.2	4.0	27.0	16.2	46.0	21.0	
	K	3.7	3.7	6.5	3.2	35.5	17.0	42.5	22.0	
	L	3.3	3.3	6.0	3.4	36.3	18.2	44.5	15.6	
	M	4.0	3.7	5.4	3.2	35.0	22.2	44.4	17.6	
	N	6.0	3.1	8.9	3.4	38.7	20.0	51.7	14.2	
	O	5.1	2.5	5.8	4.8	40.8	19.0	45.0	21.0	
	Av.	3.9	3.3	7.0	3.7	34.7	19.4	46.7	19.0	
DRILL SECTION	a	3.9	3.6	7.3	3.6	35.6	19.4	55.0	21.0	
	b	2.8	2.1	9.0	4.4	32.5	15.3	55.0	16.6	
	c	4.0	3.2	8.5	.5	37.7	21.8	55.0	24.0	
	d	4.4	3.0	9.0	4.8	35.0	17.4	58.6	28.0	
	e	5.3	3.3	12.4	3.8	38.3	19.4	68.3	12.0	
	f	3.8	3.1	12.0	5.2	34.4	12.2	71.0	20.0	
	g	1.7	2.4	5.9	4.4	21.0	16.7	45.0	22.0	
	h	4.0	3.0	6.3	3.2	33.7	15.8	48.0	20.0	
	i	4.5	2.2	8.9	4.0	35.9	13.6	53.3	16.6	
	j	5.5	4.1	10.0	5.8	50.0	21.8	68.5	22.0	
	k	3.0	2.8	7.7	5.8	33.6	18.2	49.5	22.0	
	l	4.3	2.4	9.6	4.0	34.1	14.8	57.7	16.8	
	m	3.6	2.9	8.7	5.4	33.0	18.8	57.7	26.0	
	n	5.6	4.1	9.0	5.4	46.2	21.8	55.0	26.0	
	o	3.7	3.5	9.0	4.0	34.3	18.2	57.0	22.0	
		Av.	4.0	3.1	9.0	4.5	35.7	17.7	56.9	21.0

coefficient of variability, accordingly, decreased from .78 to .50). In brief, then, the drill section increased its comprehension 5 units as against 3.1 units of the non-drill section and at the same time reduced its class variability to a slightly lower point than that of the non-drill section.

Turning to rate of reading, the following facts appear. Between January and April the non-drill section increased its median score from 34.7 to 46.7, or 12 points, whereas the drill section increased its score from 35.7 to 56.9, or 21.2 words per minute. The reduction in the coefficient of variability was, for the non-drill section, from 56 to 41 percent; in the drill section from 50 to 37 percent.

It follows from this study of over 1100 third-grade pupils in thirty classrooms of Kansas City, Kansas, that in every phase of reading considered in this study the improvement made by the classes that were drilled in reading by the games devised by the writer was more pronounced than the improvement made during a corresponding period by the classes that devoted the same amount of time to other forms of reading exercises.

#### CONCLUSIONS

The following generalizations are definitely indicated by this investigation:

1. Uneconomical methods of drill are now being employed in the lower grades of our public school system.
2. Greater use must be made of the doctrine of "Interest in Education," especially as it applies to drill work. Drill work should be motivated or vitalized by being connected with some dynamic purpose.
3. Bodily activity (dramatizations, handling of objects, etc.) can be profitably connected with exercises in silent reading.
4. Drill, to be efficient, must be made individual in character. Drill should be conducted as nearly as possible according to each child's needs and particular abilities.
5. Intensive focalization, in connection with attentive repetition, is an essential characteristic of efficient drill work and by appealing to the play instincts of children this desired characteristic is effectively provided.

## CHAPTER VI

### THE EFFECT OF A SINGLE READING

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It is curious that in the studies of silent reading no attention has been given directly to the determination of the effect of a single reading of different types of reading matter, because this would seem to be the first step in experimental work in reading.

It is true, however, that there is some indirect evidence on the matter. Ebbinghaus and others experimented with the effect of learning periods of different lengths on the retention of meaningless material. Later experimenters used logical materials in their efforts to learn about memory; and from their studies and those of the earlier experimenters, certain valuable laws of memory were formulated. But none of these studies gives an adequate idea of the extent of the memory of logical materials as the result of a single contact. Nor do the reports of Brown, Gray, Starch, Waldo, Pintner, and others bear directly on this point.

The problem is a particularly important and fundamental one. No one will deny that many children consider the lesson learned if they have read it through once. Indeed, the ordinary teacher in the elementary or the high school may consider herself fortunate if the child has read understandingly through the assignment a single time. How much has been learned as a result of this single reading? We have not fully adequate answers to this question. And so far as we know at present, the economy of re-reading a lesson again and again until, as in the early district school, it is "learned by heart" is wholly problematical. The logical procedure is to begin at the bottom by determining the effect of a single contact with different types of reading ma-

terials. The problem opens up a very significant field of experimentation which, no doubt, will be followed through by succeeding experimenters until the economy of various re-readings has been determined. The present study is only a partially successful attempt to supply some data which have been lacking and to call attention to the importance of measurement in this field.

#### MATERIALS

The materials used in this series of experiments are, with one exception, almost exclusively factual selections of varying lengths, taken from school textbooks or adapted from other sources for use in the elementary school. The selections include materials from geography, history, agriculture, civics, economics, language, and literature. This last selection was used merely for the purpose of comparing the results of reading narrative material with the results of reading factual material particularly adapted to silent reading. There follows a list of the selections with their approximate lengths:

1. *On the Use of Abbreviations*. Language material taken from the intermediate book of a language series by Jean Sherwood Rankin; length, 1200 words.

2. *Peanuts*. Adapted for experimental purposes from *Farmers' Bulletin No. 431*, United States Department of Agriculture; length, 1900 words; similar to textbook material in geography or agriculture. Prepared by C. E. Germane and used by him in connection with his doctor's thesis, "The Value of Summarizing as Compared with Re-reading of the Same Article."<sup>1</sup>

3. *The Government of Switzerland*. Prepared by G. H. Alderman for experimental purposes and borrowed by the writer; civics material; length, 1200 words.<sup>2</sup>

4. *Medieval Castles*. Adapted by the writer from Robinson and Breasted, *Outlines of European History*, pp. 387-392; length, 600 words.

5. *Chasing a Rainbow*. Adapted from an old Harper's *Fifth Reader*; narrative material; length, 1000 words.

6. *Tuberculosis*. Adapted by C. E. Germane from a pamphlet, "What we Should Know about Tuberculosis," by New York State Department of Health; length, 1900 words.

<sup>1</sup>State University of Iowa, 1920. Unpublished.

<sup>2</sup>Used in doctor's thesis, "The Lecture Method of Teaching Versus the Question and Answer Method." State University of Iowa, 1920. Unpublished.

7. *Pyramid Age*. Adapted by the writer from Robinson and Breasted, *Outlines of European History*, Part I. pp. 27-31; length 600 words. This article was rewritten in order to make it as nearly like article number four as possible.

8. *The Admiralty Islanders*. Adapted from *The Living Races of Mankind*, by H. N. Hutchinson; geographical material; length, 1000 words.

It is seen that these materials are representative of those studied in the elementary school, that they are sufficiently varied in length, and that they so differ in character as to give an opportunity to investigate the manner in which pupils will retain different types of material, an aspect of the problem which is, however, only touched upon in this series of experiments.

Articles 2 and 6 were printed pamphlets; the others were typewritten or mimeographed, with care to provide clear copy.

Two main types of tests were used for measuring the retention of these materials after a single reading: (1) controlled completion tests; and (2) tests consisting of short questions requiring a short written answer. These tests were mimeographed. Sample questions from each of these tests are given herewith:

#### TEST I

They were first visited by (Columbus, De Soto, Narveyez, Balboa, Carteret, John Cabot) in (1121, 1776, 1850, 1767, 1492.)

#### TEST II

In what two ways did the armed followers help the master of the castle?

1. ....
2. ....

It will be understood that in the first test, the child was required to cross out the words in the parentheses which correctly completed the meaning of the sentence as he remembered it, while in the second test he was required to write his answer which might consist of a word, a phrase, or a sentence. The first type of test is very detailed, requires no writing, and tests the pupil's power of choosing the right word to complete the true statement of the original fact as he remembers it. The second test is not so detailed and makes a greater demand upon the power of recall. Both tests have the advantage of being objective in scoring, of requiring little or no writing, and of actually serving

as a measure of the retention of the ideas in the original selection. The first test probably is a greater stimulus to recall; the second is more difficult to answer correctly. The results of the two tests are, of course, not directly comparable numerically.

The tests were scored by giving one point for each correct answer, adding the total points earned, and expressing the final score as a percent of the total possible score. Thus, a score of 50 means that the pupil has answered correctly 50 percent of the total possible score, or has reproduced approximately 50 percent of the total ideas in the article as a result of a single reading. It is acknowledged that there are some objections to this method, on the ground that it does not consider the effect of the relative difficulty of questions. It is thought, however, that, for the purpose of this study, the method of scoring is sufficiently accurate to give a fairly reliable idea of the amount gained as the result of a single reading.

#### METHOD OF EXPERIMENTATION

The series of experiments with the foregoing materials were conducted according to two methods: (1) a rough method in which no attempt was made to measure accurately the effect of motivation produced by an initial test previous to reading or the effect of an immediate recall upon a delayed recall; and (2) a more refined method in which an attempt *was* made to measure the effect of these factors. In all the experiments the pupils were allowed to take as much time as was necessary to complete the reading and the tests. Each pupil was allowed to proceed at his own rate. The elapsed time between reading and testing was in most cases merely long enough to allow a pupil to lay aside the reading and take up the test paper. Thus, inequalities in rate of reading were offset and the time elapsing between reading and immediate recall was approximately the same in all cases.

The general procedure in the first series of experiments was to give a test to measure the amount of previous knowledge of the material and then to follow this test by a single reading and an immediate recall. In this series, the initial test and the immediate recall test were the same. Later on, a delayed recall in

the form of the same test was given. Pupils were not told what the test was to be, but it is easily seen that the effect of this test was to motivate the reading in the first place and to furnish practice in taking the test in the immediate and delayed recall exercises.

In the later series of experiments the classes were divided into three groups by a chance selection of pupils and a different method of procedure was used with each group. The scores of each group were then used interchangeably to compute corrections for the effect of previous knowledge of the material, the effect of giving the initial test, and the effect of repetition of the test upon power of subsequent recall. In this series of tests every effort was made to keep the conditions of the experiment constant and to eliminate the effect of all uncontrolled variables. The pupils were encouraged to do their best work, not to guess at the answers, and to regard the experiments in the light of interesting exercises not affecting their class standing. The experimenter feels that in the large majority of cases the experiments successfully measured the effect of a single reading and that the pupils gave their best efforts to the experiments.

#### RESULTS OF THE EXPERIMENTS

The results of the experiments as conducted in four schools and involving in all 417 pupils are summed up in this section. Experiments with several of the articles, namely, *Peanuts*, *Abbreviations*, and *Admiralty Islanders*, involved pupils in Grades IV to VIII, inclusive, in four schools. Experiments with the other articles were conducted in a single school. Three of the schools were typical Iowa public schools, and the fourth was the Observational School, State University of Iowa, Grades IV to VII, inclusive.

The following tables will give a general idea of the results of the experiments. Table 1 gives the distribution of scores made by Grades IV, V, and VI on the article *Peanuts*, after a single reading.

It is seen from Table 1 that the ability to reproduce the ideas in this article after a single reading preceded by an initial test

TABLE 1

DISTRIBUTION OF SCORES MADE AFTER A SINGLE READING OF THE ARTICLE ON PEANUTS

Interval*	Grade IV	Grade V	Grade VI
85-89.9	0	1	1
80-84.9	0	0	4
75-79.9	0	1	2
70-74.9	1	0	1
65-69.9	0	4	2
60-64.9	2	0	1
55-59.9	2	1	4
50-54.9	1	3	2
45-49.9	0	2	7
40-44.9	4	1	3
35-39.9	1	3	4
30-34.9	1	4	2
25-29.9	4	5	3
20-24.9	3	3	2
15-19.9	11	3	2
10-14.9	4	4	2
5-9.9	6	1	0
0-4.9	3	1	1
Total	43	37	43
Average	24.5	36.2	47.5
Median	18.9	31.8	46.2
Quartile Deviation	14.	15.5	14.9

\*The intervals are in terms of percents of the total possible score. Thus, the score 85-89.9 indicates that the pupil who made this score performed correctly 85 to 89.9 percent of the total possible answers in this test.

varies widely among individuals in the same grade, that there is marked over-lapping of grades, and that distinct progress is shown from grade to grade. This distribution is typical of those obtained.

Table 2 gives a summary of the average initial scores and the immediate and delayed recall scores made by the different grades

TABLE 2

EFFECT OF A SINGLE READING AS MEASURED BY IMMEDIATE AND DELAYED RECALL

Selection	Grade	No Pupils	Initial Test	Range Immediate Recall	Range Delayed Recall	Range
1. Peanuts .....	4	43	10.5	0-29.9	47.5	0-74.9
2. Peanuts .....	5	37	15.3	0-44.9	36.2	0-89.9
3. Peanuts .....	6	43	21.9	0-54.9	24.5	0-89.9
4. Adm'ty Islanders..	8	22	17.0	0-39.9	53.8	0-89.9
5. Adm'ty Islanders..	7	10	18.7	10-29.9	54.1	30-79.9
6. Adm'ty Islanders..	6	24	11.4	0-29.9	40.4	10-79.9
7. Adm'ty Islanders..	5	24	11.0	0-29.9	31.2	0-79.9
8. Adm'ty Islanders..	4	8	6.0	0-19.9	19.0	0-39.9
9. Abbreviations .....	8	3	28.0	16-42.0	46.0	28-70.0
						47.0
						28-66.0

With the first eight of these selections the controlled completion test was used, with the ninth a yes-and-no test, with paired answers to test recall. The time between immediate and delayed recall, in the experiment with *Admiralty Islanders* was 20 days; in the experiment with *Abbreviations*, 6 days.

*Initial test* is the test given to measure previous knowledge; *immediate recall* is the test given immediately following a single reading; *delayed recall* the test given after a lapse of 20 or 6 days.



(one group in each grade) in four schools on three different articles. The scores are typical of those found in all the experiments.

Table 2 shows that the amount retained after a single reading of the articles, uncorrected for the effect of motivation due to the initial test, ranges from roughly one-fifth of the total ideas in Grade IV to one-half in Grade VIII on the material *Admiralty Islanders*; on the article *Peanuts*, the range is from one-fourth in Grade IV to one-half in Grade VI; on *Abbreviations*, the amount is roughly one-half in Grade VIII. The effect of previous knowledge ranges from 6 percent in Grade IV to 30 percent in Grade VIII. The effect of the lapse of time on the retention of the facts in the article *Admiralty Islanders* represents a loss ranging from 4 percent in Grade IV to 12 percent in Grade VIII after 20 days. After 6 days the pupils in Grade VIII reproduced better than on immediate recall.

Table 3 summarizes the results of a series of tests in a sixth grade on various articles of different lengths. Two types of tests were used in measuring the effect of reading. The results are therefore only roughly comparable, but they are suggestive of differences due to the character and length of the materials.

TABLE 3  
EFFECT OF A SINGLE READING ON VARIOUS TYPES OF MATERIAL IN A SIXTH GRADE

Selection	Initial Score	Immediate Recall	Delayed Recall	Test Used	Days Elapsing
1. Gov't of Switzerland.....	10.0	43.9	25.0	A	54
2. Medieval Castles .....	16.3	37.4	27.3	B	31
3. Chasing a Rainbow.....	34.8	78.0	70.3	A	39
4. Tuberculosis .....	14.8	31.6	21.1	B	36
5. Peanuts .....	21.9	47.5	...	A	..

A indicates a controlled completion test, B a test of short questions. The scores are in every case percents of the total possible score.

Assuming equality of tests, differences in the difficulty of the various materials are clearly indicated in the above table. The amount which pupils were able to score correctly before reading the article a single time ranges from 10 percent to 34.8 percent. It is possible that this amount is due partly to their ability to answer the completion test questions without reading the original article and that this ability is the direct result of native intelligence. It is probable, however, that the score made on the test

of short questions, Test B, is the result of previous knowledge, since in this test no chance was given to guess the answer; the form of the question required a knowledge of the fact. The range of correct answers after a single reading shows that either the ability to reproduce the ideas is not so great on factual material as on narrative material, or that the tests were very unequal in difficulty. It is true, of course, that the difference shown here may be due entirely to differences in the difficulty of the tests, rather than to differences in the difficulty of the reading matter.

The foregoing scores are representative of the gross average scores made by pupils in the series of experiments in which no attempt was made to measure any variable other than the effect of previous knowledge possessed by the pupil and the effect of a single reading preceded by an initial test. When the pupil read the article under such conditions, the reading was strongly motivated by the initial test. The result is a measure of a single reading under extremely advantageous conditions. The writer felt that in order to get at the effect of a single unmotivated reading, he ought to make an attempt to measure the effect of the repetition of the test on subsequent recall and the probable influence of the motivation on the single reading. This demanded another series of experiments, the results of which are set forth in the following tables.

The method of isolating the variables in these experiments was to divide the grade into three groups, A, B, and C. The teacher furnished a list of the pupils in each grade divided into three parts, good, medium, and poor pupils, according to their ability in reading. The experimenter then grouped these pupils into three divisions, one-fourth in Group A, one-half in Group B, and one-fourth in Group C, endeavoring to have an equal proportion of good, medium, and poor pupils in each group. Pupils were drawn at random by the experimenter from each group. When the divisions had been made, Group A was given an initial test, allowed to read the article once and then given an immediate recall. Group B was not given an initial test, but read the article once and then took an immediate recall test. Group C read the article once, but performed no test of previous knowl-

edge nor of immediate recall. Then, after a lapse of some days or weeks, all three groups were given a delayed recall. The scores of Group B were then corrected for the effect of previous knowledge by subtracting the initial scores of Group A from the immediate recall scores of Group B. In a like manner, the scores made by Group C were used for purposes of correction. The results of these corrections are given in the following paragraphs and tables.

The validity of this procedure rests, of course, upon the method of dividing the groups and upon the assumption that the groups when divided are equal in ability. The writer had to rely upon the judgment of the teacher in dividing the grade into good, medium, and poor pupils, and then upon random placing of these pupils into three representative groups. It would have been better to have divided the grades on the basis of their standard scores in silent reading, perhaps, but these were not available. As a means of making the resulting averages, obtained from the three different groups, somewhat more reliable, the writer smoothed them according to the following formula given by Rugg in his *Statistical Methods Applied to Education*, page 184.

The effect of this smoothing upon the original measures is shown below. The original grade averages on immediate recall, selection *Admiralty Islanders*, were:

Grade VIII	VII	VI	V	IV
53.8	54.1	40.4	31.2	19.0

The result of the first and second smoothings was to reduce the inequalities between the scores of the different grades as follows:

	Grade VIII	VII	VI	V	IV
1st Smoothing .....	53.4	49.4	41.9	26.8	23.0
2nd Smoothing .....	52.4	48.2	39.3	30.5	24.2

The averages, after the second smoothing, were used in computing the corrections and in estimating the effects of various factors in the experiment<sup>3</sup>.

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<sup>3</sup>The writer believes that these smoothed averages represent more nearly what the actual averages would have been, had more pupils been measured. It is recognized that such a procedure is rather arbitrary and perhaps of dubious value, but the results obtained are at least suggestive that there are many factors operating in reading which are ordinarily not considered and which deserve careful study.

Table 4 gives the scores of Grades IV to VIII, inclusive, in three schools on the article *Admiralty Islanders*, after these averages have been smoothed in accordance with the method just mentioned. The general effect of this smoothing has been to reduce the irregularities in the grade averages which were probably due to faulty selection of the different groups within the grade and to differences in ability among the several schools. That is to say, in the long run, one would naturally expect Grade VIII to read better than Grade VII and Grade VII to read better than Grade VI.

TABLE 4  
AVERAGE SCORES OF GROUP A WITH THIS ARTICLE ON ADMIRALTY ISLANDERS

Grade	Cases	Initial Test	Immediate Recall	Recall After 20 Days
8	9	16.9	52.4	48.7
7	10	15.6	48.2	43.1
6	8	13.2	39.3	31.7
5	8	10.1	30.5	28.5
4	8	8.5	24.2	22.8

Table 4 shows that the power to handle the various tests increased from grade to grade.

Table 5 shows the scores for Group B for immediate and delayed recall, but no initial test.

TABLE 5  
AVERAGE SCORES OF GROUP B WITH THE ARTICLE ON ADMIRALTY ISLANDERS

Grade	Cases	Immediate Recall	Delayed Recall
8	17	37.8	32.5
7	21	34.6	30.1
6	20	29.8	26.0
5	16	24.7	19.9
4	16	17.0	16.1

The scores of Group C for the same selection, as measured by delayed recall only, are shown in Table 6.

TABLE 6  
AVERAGE SCORES OF GROUP C, WITH THE ARTICLE ON ADMIRALTY ISLANDERS

Grade	Cases	Delayed Recall Only
8	10	18.2
7	8	16.3
6	10	15.9
5	9	13.9
4	8	13.6

By using the averages in the previous tables a correction of the various scores for the effect of different variables is attempted as shown in the tables that follow. Thus, in Table 7 it is argued

TABLE 7

EFFECT OF VARIOUS FACTORS AS MEASURED BY INITIAL TEST AND IMMEDIATE RECALL  
(Using Scores of Groups A, B, and C on *The Admiralty Islanders*  
Interchangeably for Correction)

Grades	VIII	VII	VI	V	IV
Effect of Previous Knowledge.....	16.9	15.6	13.2	10.1	8.5
Effect of a Single Reading.....	20.9	19.0	16.6	14.6	7.5
Effect of Motivation of Initial Test.....	14.6	13.6	9.5	5.8	7.7

that in our experiments there are three large factors that effect the retention of material read; namely, previous knowledge, motivation due to the initial test, and a single reading of the article. Now the effect of previous knowledge in the above table is indicated by the scores of Group A. This amount subtracted from the scores of Group B made on immediate recall, gives the effect of a single reading by Group B, or the figures under the caption "Effect of a Single Reading." But when there is subtracted from the immediate recall score of Group A, this effect of previous knowledge, there is still a remainder, as given under caption "Effect of Motivation." This may or may not be due to motivation. Probably it could be due to superior ability on the part of Group A, but there is a likelihood that motivation is a primary constituent in it, since it is found quite consistently in all the grades.

TABLE 8

EFFECT OF VARIOUS FACTORS AS MEASURED BY DELAYED RECALL  
(Scores on *The Admiralty Islanders*)

Grades	VIII	VII	VI	V	IV
Effect of a Single Reading on Delayed Recall..	1.3	0.7	2.7	3.8	5.1
Effect of Immediate Recall.....	14.5	13.9	10.1	6.0	0.5
Effect of Reading and Two Tests.....	32.8	25.4	17.6	9.9	9.0
Effect of Reading and One Test.....	15.8	14.5	12.8	9.8	7.6
Effect of Two Tests.....	30.5	23.7	14.9	6.1	4.0
Effect of One Test.....	14.9	13.9	10.1	6.0	2.6

The effect of these various factors when measured by delayed recall is even more striking. By using the scores of Groups A, B, and C interchangeably to correct for the effect of motivation, repetition of the test, and previous knowledge as measured by delayed recall, we obtain the material embodied in Table 8. In

that table, to be more specific, the scores are obtained by subtracting from the scores of Group B on delayed recall, the amounts due to the effect of a previous knowledge, as shown by the initial score of Group A, and due to repetition of the test, as shown by the difference between the delayed recall scores of Groups B and C. In a like manner, by manipulating the various scores, corrections for the variable factors have been computed. It appears that, after the variable factors have been considered, the effect of a single reading upon power of delayed recall is very slight. The writer does not claim a high degree of precision for these statistical manipulations, but the general significance of the table is clear. The motivation due to the initial test and the effect of the repetition of the tests apparently far outweigh in importance the brief, though indispensable, contact with the material. This bears out the general laws of memory very clearly. Strongly motivated repetition is necessary if ideas of this kind are to be retained for any length of time, at least with children of the elementary grades.

### CONCLUSIONS

There are no startling novel conclusions to be drawn from these data, but the conclusions of other experimenters who have been working along this line are made more secure through the addition of numerical evidence. Broadly speaking, the result of the experiments is to show how inadequate a single reading really is when taken alone and to suggest that in seeking for means to improve our methods of study we need to determine experimentally the relative efficiency of various devices for improving methods of studying. For instance, it is hoped that later experimenters will investigate the efficiency of various re-readings.

Some particular conclusions that have a direct bearing on our educational problems and which may be directly applied to the pedagogy of reading are enumerated below.

1. As far as the elementary school child is concerned, from a single reading of factual material like that we employed only a small proportion will be retained.

2. Giving an initial test that shall determine the amount of existing knowledge brings about better retention of the material subsequently read.

3. Repeated testing is an efficient method of securing permanent retention of material; whether more efficient or less efficient than other methods remains to be seen.

4. Ability to reproduce one type of material after a single reading does not imply equal ability to reproduce another type of material in equal amount. There are differences in the difficulty of reading due to the length of the material, its character, the number of facts it contains, and the interest it has for pupils, which deserve careful consideration.

5. A single reading without immediate recall, or review, of the ideas probably leaves little effect on the mind of an elementary-school pupil after a lapse of 20 or 30 days, unless the material is highly motivated or strikingly interesting.

6. The ability of pupils in the elementary school to reproduce ideas after a single reading increases from grade to grade, but cannot be regarded as highly developed even in the eighth grade.

7. There are wide individual differences in this ability, as in others. There are a few gifted individuals who can read material like ours once and retain 80 percent of its entire content (see Table 1), but the average child is far from this efficiency. The educational implication is therefore obvious.

8. Teachers will do well to investigate what takes place between the assignment of the new lesson and the recitation that follows in order to insure that more than a single reading of the new material takes place; particularly in schools where extensive reading occurs, must the reading and study habits of the pupils during the study periods be investigated.

## CHAPTER VII

### OUTLINING AND SUMMARIZING COMPARED WITH RE-READING AS METHODS OF STUDYING<sup>1</sup>

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Much has been said and written by those working in the field of education concerning the value of outlining and summarizing as methods of studying. Nevertheless, there are so few scientific data on the subject that it seemed worth while to try to determine by direct experimentation in the classroom the comparative values of certain forms, at least, of summarizing.

#### I. THE VALUE OF THE SELF-MADE SUMMARY

##### The Problem

Stated briefly, the problem which we first set ourselves was: What is the value of making a "corrected summary-outline" of an article as compared with re-reading the same article for the same length of time?

The procedure in making what we may term a "corrected summary-outline," or a "self-made summary," involves the following steps:

1. The article is read once through as a whole.
2. A brief summary-outline is written from memory.
3. The article is glanced over to discover what points of importance have been forgotten or overlooked in making the summary.
4. The summary is corrected by adding points omitted or by altering incorrect statements.

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<sup>1</sup> This study was completed at the University of Iowa under the direction of Professor Ernest Horn and embodied in Dr. Germane's doctorate dissertation.



## Method of Experimentation

1. *Selection of Material.* After considerable preliminary experimenting, an eight-page article on "What We Should Know About Tuberculosis" was selected as being suitable for the purposes of this study. This article was adapted from a pamphlet issued by the New York State Department of Health. It was found not to be too difficult for the grades in which the study was conducted, nor did it contain material that was covered in the usual class work.

2. *Division of the Class.* In order to measure the efficiency of the corrected summary as a method of studying, it was necessary to divide the pupils taking part in this experiment into two groups as nearly equal as possible in comprehension ability in silent reading. This was done by having the teachers of the various classes rank their students according to their ability to comprehend what they read. The pupil who ranked 1 was placed in the first group, 2 and 3 in the second group, 4 and 5 in the first, etc.

The ranking of the teachers was compared with the pupils' ranks according to their intelligence quotients and the following Spearman correlations found: Grade V, .62; Grade VI, .71; Grade VII, .68; Grade VIII, .65; and Grade IX, .72.

3. *Method of Measuring Comprehension.* Two rigorous tests were used to measure the comprehension. The first was a question-and-answer test covering the material read and involving points of major and minor importance. The second was a recognition test. Four answers were suggested for each question, of which only one was correct, and the pupils were asked to underline the correct answer. This form of test was used in conjunction with the first because of the possibility of children being able to *recognize* an answer they could not *recall* and also because of the possibility of measuring finer differences.

4. *Method of Scoring.* One point was given for each correct answer. The questions were all worded in such a way as to admit of but one possible answer. All the papers were graded by the writer and a graduate student who had worked through the material and helped in the administration of the experiment.

5. *Administration of the Experiment.* This experiment was conducted in Grades V to IX, inclusive, of the Elementary and Junior High Schools of the State University of Iowa. The Summarizing Group was called Group A and the Re-Reading Group, Group B. Both groups worked at the same time but in different rooms.

The instructions to Group A were as follows:

"1. In the pamphlet is an article on 'Tuberculosis.' Read it through once as rapidly and carefully as you can, asking yourself as you read, 'What is it all about and what are the main points in it that I should know and remember?'

"2. Turn the article face downward and on the paper provided make a summary of what you have just read. That is, write down all the main points or ideas that you think this article contains. At the same time, try to organize the main points under headings.

"3. Take up the article on 'Tuberculosis' and again look it over carefully and as you read write down the main points omitted or correct those already written if they are wrong."

In order that the pupils in Group A might know exactly the method of procedure in the experiment, ten minutes were spent in class in summarizing three short paragraphs just as the whole article was to be summarized. In this preliminary the experimenter emphasized the necessity of speed and brevity. Thirty minutes were then allowed for reading and summarizing, and at the end of that time the two tests were given.

The method of procedure in Group B was as follows: The class was given the article on "Tuberculosis" and asked to read it as many times as possible in the thirty-minute period. At the end of that time, Group B was subjected to the same two tests as Group A.

## Results

In Table 1 a summary of the results is presented.

TABLE 1

TOTAL SCORES MADE BY THE SUMMARIZING GROUP (A) AND THE RE-READING GROUP (B) IN THE FIVE DIFFERENT GRADES ON THE READING MATERIAL "TUBERCULOSIS"

Grade	V	VI	VII	VIII	IX
Group B	167	145	177	247	227
Group A	160	128	147	216	198
	<u>7</u>	<u>17</u>	<u>80</u>	<u>31</u>	<u>29</u>
Percent B Excels A	4.4	13.3	20.4	14.3	14.7

An examination of this table shows that in every grade the group that merely re-read the article retained more than the group that read and summarized.

### Conclusions

Since this experiment was conducted in only one school and since only one type of reading material was used, too much emphasis should not be placed on the results. However, taken in conjunction with analyses of the summaries made by the pupils, they would seem to indicate that, given such summarizing ability as these students possessed at the time of the experiment, the following statements are warranted:

1. The Re-Reading Group (B) shows a consistent superiority ranging from 4.4 to 20.4 percent.

2. Since the Re-Reading Group excels in every grade tested, the relative value of a corrected summary as a method of study is distinctly questionable.

3. An analysis of the corrected summaries of many of the pupils indicates that much of the thirty minutes was spent in indiscriminate note-taking.

4. It is possible that the advantage of the Re-Reading Group lay in the fact that the pupils in it used the entire period re-reading the article *in its entirety* and perhaps also mentally summarizing it.

## II. THE VALUE OF THE SUMMARY WHEN STIMULATED AND DIRECTED BY SPECIFIC PROBLEMS

As just indicated, the work of the pupils who participated in the first experiment led the writer to believe that some form of controlled summary would give better results. Consequently, the following study was undertaken.

### The Problem

What is the value of attempting to interest pupils in an article and placing in their hands a set of questions on that article *before reading it* as compared with the re-reading of the same article?

Probably the problem would be better understood if at this point we anticipate our discussion of method by inserting an original set of instructions to the pupils. By reading these instructions, it will be seen ~~how we sought to~~ interest the pupils in their reading about peanuts by introducing two paragraphs of general information on the peanut industry. It was thought that by reading two such paragraphs in concert twice, a 'problem attitude,' or mental 'warming up' would be produced.

### PEANUTS

#### INSTRUCTIONS TO THE PUPIL FOR SUMMARIZING THROUGH THE USE OF SPECIFIC PROBLEMS

##### *To the Pupil:*

The peanut industry in the United States has grown by leaps and bounds during the last 10 years. Last year's crop alone was valued at \$12,000,000, which was greater than the value of the entire peach and onion crop in the United States for the same year. The increased interest in peanut raising is due to many causes, the chief of which is *the use of the peanut as a food*, especially as a meat substitute.

Suppose that a number of Iowa farmers interested in growing peanuts came to you for advice, and raised the following 12 questions or problems listed below. WHAT WOULD YOU SAY IN ANSWER TO EACH OF THESE TWELVE PROBLEMS?

1. WHAT ARE YOUR REASONS FOR SAYING THAT THE RAISING OF PEANUTS IS PROFITABLE?

2. WHAT KIND OF SOIL IS BEST? WHY?

3. IN WHAT STATES DO YOU THINK WE COULD MOST SUCCESSFULLY RAISE PEANUTS?

4. WHAT EFFECT HAS BARNYARD MANURE ON THE PEANUT CROP? HOW SHOULD WE USE IT?

5. OF WHAT USE IS LIME AS A FERTILIZER? HOW SHOULD WE USE IT?

6. IN THE SELECTION OF PEANUTS FOR PLANTING, WHAT ARE THE QUALITIES WE SHOULD LOOK FOR?

7. WHICH SHALL WE PLANT, THE SHELLED OR UNSHELLED PEANUTS? WHY?

8. HOW CAN WE TELL WHEN THE PEANUTS ARE READY TO DIG?

9. WHAT METHODS ARE USED IN DIGGING PEANUTS? WHICH WOULD YOU ADVISE AS THE BEST?

10. WOULD YOU ADVISE STAKING OUR PEANUTS? WHY?

11. WHAT METHODS DO THEY EMPLOY IN PICKING PEANUTS? WHAT, IN YOUR OPINION, IS THE BEST METHOD?

12. WHAT PRECAUTIONS SHOULD WE TAKE IF WE WISH TO USE THE PEANUT VINES FOR FEEDING STOCK?

## DIRECTIONS FOR READING:

In the booklet you will find an article on "Peanuts" which is taken from a bulletin of the United States Department of Agriculture. Read it through once rapidly and carefully. As you read, keep in mind these 12 PROBLEMS, OR QUESTIONS, of the farmers.

When you have finished reading the article through once, write down in the space marked "Time" the last number that you see on the blackboard. Then on the paper provided, write down the answers to these 12 problems. Refer to the article as often as you wish in writing down these answers.

BE SURE THAT YOU ANSWER VERY BRIEFLY AND YET VERY ACCURATELY THE 12 PROBLEMS.

NAME . . . . . CITY . . . . .  
 DATE . . . . . SCHOOL . . . . .  
 GRADE . . . . . TIME . . . . .  
 GROUP . . . . .

## Method of Experimentation

1. *Selection of Material.* After considerable preliminary experimenting in the Elementary and Junior High Schools of the State University of Iowa, the following two selections were chosen as being suitable for the purposes of this experiment: (1) the article on "Peanuts" just mentioned, and (2) an article on "Immigration," adapted from Beard and Bagley's *American History*. These articles were both about 9 pages in length and were of such a nature that it was not difficult to give them the 'problem setting.'

2. *Division of the Class.* To conduct this experiment successfully it was necessary to divide the pupils into two groups of as nearly equal comprehension ability in silent reading as possible. An article on the "Sweating System," adapted from Towne's *Social Problems*, was used for this purpose. This article was chosen because the pupils in the grades in which the experiment was conducted were almost totally unfamiliar with the subject matter.

To validate and justify this method of dividing the class into two groups all three articles were given to a group of 20 students under similar conditions. The instructions for the tests were identical, to read the article twice and then answer a list of questions. The following Pearson correlations were obtained:

"Sweating System" and "Peanuts" . . . . . .64  
 "Sweating System" and "Immigration" . . . . . .90

These rather high positive correlations indicate that ability to comprehend one article is closely correlated with ability to comprehend the other articles.

3. *Method.* The experiment proper was conducted in Grades VI to IX, inclusive, of a representative public school in Iowa. The Summarizing Group was called Group A and the Re-Reading Group, Group B.

After the instructions to the Summarizing Group had been carefully read in concert twice and any questions answered concerning them (three minutes allowed for the reading and questioning), the signal to start was given. A period of 27 minutes was allowed for reading the article and answering the questions. At the end of that time the pupils were submitted to a rigorous 15-minute test.

The Re-Reading Group was told to read the article through carefully as many times as possible in the 30-minute period. The same 15-minute test was given to the pupils in this group at the end of their reading period.

It will be noted that the Re-Reading Group was given three minutes longer than the Summarizing Group. This addition of time seems justifiable, since the Summarizing Group, as we have seen, spent three minutes in 'warming up' by reading the two paragraphs of general information about the peanut industry.

## Results

In Table 2 a summary of the results is presented.

TABLE 2

SCORES OF THE SUMMARIZING GROUP (A) AND THE RE-READING GROUP (B) WITH THE TWO TYPES OF MATERIAL, "PEANUTS" AND "IMMIGRATION"

Grade	Peanuts				Immigration	
	VI	VII	VIII	IX	VIII	IX
Group A	311	402	511	587	368	441
Group B	296	461	480	547	310	415
Difference	15	1	31	40	58	26
Percent A Excels B	5	0	7	8	17	6

## Conclusions

1. The data of Table 2 seem to indicate that controlling the summary by presenting to the pupils a list of questions before read-

ing the article and trying to arouse their interest in it is a somewhat more efficient method than the re-reading of the article.

2. The Summarizing Group would have made a higher score, had the pupils known how to skim an article for answers to questions.

This statement is verified, first, by the fact that "time" was called before the pupils had finished answering all the questions, and second, by the fact that more or less confusion prevailed in the Summarizing Group during the study period. The method of looking up answers to questions rapidly and writing them was a new method of studying and an undue amount of time was wasted in turning from the questions to the reading material too frequently.

### III. THE VALUE OF THE DIRECTED SUMMARY WHEN WRITING IS ELIMINATED

In the second experiment it was found that the pupils in the Summarizing Group were unable to finish answering all the questions on the summarizing forms given them because they lacked ability to express the answers briefly, and hence gave too much time to writing; and because the continuity of reading was broken by having to stop frequently to write the answers to the questions.

Accordingly, it was thought that a controlled summary in which writing was eliminated would be worth trying. To this end two experiments were conducted by the writer upon two quite different classes of students and with two specimens of reading material quite different in content and style.

#### A. *Experiment with College Students*

##### The Problem

What is the value of reading an article through once and devoting the rest of a given period to finding, but not recording, the answers to the test questions already placed in the hands of the students as compared with the re-reading of the article for the same length of time?

### Method of Experimentation

1. *Material.* The selection used was a nine-page article on the Government of Germany, by Hazen. The subjects were 88 students, mostly sophomores, in two classes in Principles of Education in one of the colleges of Iowa.

2. *Division of the Class.* Monroe's Reading Test, No. III, was used for the purpose of dividing the class into two groups of equal reading comprehension ability. Thirty-five pairs who made practically identical scores on this test were selected out of the 88 students. In no case was there a pair whose difference in score was over two points.

3. *Administration of the Experiment.* The time allowed was 20 minutes. The Summarizing Group was told to read the article through once rapidly and carefully, then to take up the list of questions and answer them mentally, being sure to skim through the article for answers to any questions they might not be able to recall.

The Re-Reading Group was told to read the article through as many times as possible in the 20 minutes.

Only 20 minutes were allowed for reading the article, because only a few students could finish reading it twice in that time. This was judged to be the optimal time for the Re-Reading Group in view of the interest in the article and of its difficulty.

At the end of this period, each section was given a rigorous 10-minute test upon the material just read. This test comprised the same questions that the Summarizing Group had been mentally attempting to answer.

### Results

In Table 3 the results are presented. It will be seen that Group

TABLE 3  
SCORES OF THE SUMMARIZING GROUP (A) AND THE RE-READING GROUP (B) WITH THE MATERIAL "THE GOVERNMENT OF GERMANY"

	Aggregate Score	Range	Median	Third Quartile	First Quartile
Group A	732	9-32	21	24	17
Group B	561	5-24	17	20	11

A scores, in the aggregate, 171 points, or 30.5 percent, more than Group B, and that its curve shows superiority throughout.



### Conclusions

1. These data seem to indicate that the use by the students of specific questions on the assignment is much more efficient than undirected reading occupying the same amount of time.

2. The Summarizing Group, we feel sure, worked more effectively because it did not waste time in writing.

### *B. Experiment with School Children*

The problem here is identical with that of the preceding experiment with college students.

### Method of Experimentation

1. *Material.* The material used in this experiment was the article on "Tuberculosis." It lends itself readily to this method of asking questions. The three big problems discussed in it are: (1) sources of tuberculosis, (2) symptoms of the disease, (3) preventatives.

2. *Division of the Class.* The subjects were pupils in Grades VI, VII and VIII of a representative public school of Iowa. Monroe's Silent Reading Test, No. II, was used for the purpose of dividing them into two groups of equal comprehension ability in silent reading.

3. *Administration of the Experiment.* The Summarizing Group (A) was asked to read the article through once and then quickly to take up the list of questions on their desks and answer them mentally. The pupils were told to refer to the article freely in their work. At the end of 25 minutes, they were given a rigorous 15-minute test. This test was made up of the same questions that they had been attempting to answer mentally.

The Re-Reading Group was told to read the article through as often as possible in the 25-minute period. At the end of that time, the pupils were given the same test as was given to those in Group A.

### The Results

The results are, in summary, an aggregate score of 617 for Group A and 401 for Group B. The difference, 216, in favor of the Summarizing Group, is a 53.8 percent superiority.

### Conclusion

The figures for the school children confirm and intensify the findings with the college students. They show that the use by the pupils of specific questions on the assignment is a much more efficient method of studying than the expenditure of the same amount of time in undirected reading.

## CHAPTER VIII

### MEASURING COMPREHENSION OF CONTENT MATERIAL

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#### INTRODUCTORY

Teachers have long complained that pupils do not know how to study. Particularly has this complaint been directed to the studying of those sources of information and knowledge commonly called the content subjects. It has remained for the recent change in emphasis which has taken place in the field of reading to bring out the fact that, after all, the difficulty is chiefly one of reading. Pupils who glibly read a paragraph orally fail miserably when confronted with an exact check on the meaning of what they have read. If we are to judge from the parrot-like precision with which they orally reproduce the printed page, we are almost convinced that they comprehend. However, when we carefully investigate their real understanding of what they read, we begin to have serious doubts as to the efficiency of our reading instruction.

The material described on the following pages was originally prepared for the purpose of determining something of the extent to which pupils in certain of the elementary school grades do comprehend easy, straightforward, factual material, when measured by a rather exacting test. The chief purpose in presenting it here is to show that it is perfectly possible and practicable for any teacher to reproduce these tests or devise other similar tests, superior to these, for the purpose of measuring the ability of her pupils in reading this type of material, or of training them in this kind of reading. The material presented is merely typical of what may be done. It does not represent a finished product. It is not a standardized test.

It should be pointed out at the outset that the measurement of silent reading represents a rather complex problem. There has

been a tendency to break up silent reading into a number of distinct abilities, chief among which are *rate of reading* and *comprehension of material read*. Other factors contributing to these two and often listed with them are: the ability to re-organize the material, the ability to recall the essentials at a later date, and the ability to read the proper kind of material with enjoyment. Stated briefly, these factors become, in order: organization, memory, and appreciation.

The objective measurement of rate of reading, while sufficiently complicated, has been more successfully accomplished than has the measurement of comprehension. In the data presented here the emphasis is placed on the factor of comprehension as measured by a distinct device, very objective and exacting in its character.

In general, the measurement of comprehension in silent reading follows one of three lines. In the first the subject is asked to read the selection and then to indicate his understanding of it by his ability to reproduce either verbatim or idea for idea, as much as possible of the material read. This plan is used in the test devised by Starch and by Gray.

The second type of test checks the comprehension by means of questions, either of the controlled or uncontrolled answer sort. The Thorndike Scale Alpha 2 is an example of the first of these, and the Courtis Series R, Test 2, of the second type.

The third type of test used has been called a "directions test." In tests of this character the subject is asked to indicate the understanding of the material read by the completion of some act, by the giving of some definite objective response which leaves a record. This idea was utilized in the original Kelly Silent Reading Tests, and followed again in Monroe's more recently developed tests. It is this third type of comprehension exercise which is utilized in the tests herein described, though with the difference that the material upon which the comprehension exercises are based is logical, factual, and related throughout. The understanding of the selection is indicated by certain definite responses to exercises covering the material. These responses are obtained in such a way that an objective record is obtained.

## FIRST EXPERIMENT: THE 'WHEAT TEST'

The first of these tests<sup>1</sup> with which experiments were made by the writer is known as the "Wheat Test."

The following is an exact duplication of the directions, material, and exercises as presented to the pupils for testing.

I want to see how carefully you can read a short paragraph. After you have read it, you will be asked to answer some questions about it. In answering these questions there are three things you should be sure to remember. They are:

1. Give just the information needed to answer each question, but make sure that the answer you give is to be found in the paragraph.
2. If any question is asked for which you think there is no answer given in the paragraph, write on your paper "the paragraph does not tell."
3. You may read the paragraph as often as you wish to make sure that your answers are correct.

Now that you know exactly what to do, read the following paragraph and answer the questions just as you have been told, remembering that you may have all the time you need.

The chief wheat belts extend through the valleys of the Missouri, the Ohio, and the upper Mississippi. Of all the states in this region Minnesota raises the most wheat. There is another belt along the Pacific coast. The present center of wheat production is about 100 miles west of Des Moines, Iowa; since 1850 it has moved westward nearly seven hundred miles, and northward about one hundred miles.

## Answer these questions.

1. Mark on the accompanying map the chief wheat belts of the United States by using a large letter "W" in the proper places.
2. Place a number one (1) in the state raising the most wheat, on the map.
3. Place a small cross (x) where the present center of wheat production is located.
4. Show by an arrow (➡) the direction on the map in which the center of wheat production has moved 700 miles since 1850.
5. Show by a star (\*) on the map about where the center of wheat production previous to 1850 was located.

The map to which reference is made in the directions was merely an outline map of United States. Names of states and cities were not shown, but the names of the river valleys mentioned

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<sup>1</sup>The writer desires to acknowledge the guidance and co-operation of Dr. Ernest Horn in the development of these test devices.

in the paragraph were printed in with a small rubber stamp outfit (see Figs. 1 and 2). The paragraph itself was selected from a commonly used geographical reader which is judged to be easy enough to be read by children of the lowest grade in which the test was given.

The test was given to a number of children in Grades IV, V, and VI. The responses were scored by the writer on an arbitrary, but consistent basis, by allowing zero, one, two, and three points for a question, depending upon the exactness of the answer. Following is the key used for scoring the tests:

Question	Score	Basis
I	3	"W" marking the valleys of the Mississippi, Missouri, and Ohio rivers, and Pacific coast.
	2	"W's" marking the three river valleys.
	1	"W" marking one of the three valleys.
	0	No "W" correctly placed, or "paragraph does not tell."
II	3	A number one (1) in Minnesota.
III	3	(x) in western Iowa.
	2	(x) in Nebraska.
	1	(x) in South Dakota, or Kansas, or further west, or "paragraph does not tell."
IV	3	Arrow in Ohio pointing toward Iowa.
	2	Arrow elsewhere to east of Iowa pointing westward.
	1	Arrow elsewhere on map pointing westward.
	0	No arrow, or arrow not pointing westward, or northwest, or "paragraph does not tell."
V	3	A star (*) in Ohio.
	2	A star in Illinois, Indiana, Penn., or Ky.
	1	A star anywhere east of present center (100 miles west of Des Moines, Iowa).

On this basis the results presented in Table 1 were obtained. The table shows the percentage of pupils in each grade that earned the various scores for each question. Eight and three-tenths percent of the 24 fourth-grade children tested received the highest possible score of three points on the first question. Twenty-five percent of these 24 children scored two points, etc. These data show some very interesting variations in the difficulty of the exercises for the three grades under test. Clearly Exercises IV and V are the most difficult, when it is remembered that every child was given an opportunity to complete the test.

TABLE 1

PERCENTAGE OF PUPILS MAKING VARIOUS SCORES ON EACH OF THE FIVE EXERCISES IN THE 'WHEAT TEST'

Exercise	Score	Grade Pupils	IV 24	V 11	VI 22
I	3		8.3	9.1	41.0
	2		25.0	54.5	31.7
	1		50.0	36.4	27.3
	0		16.7	0.0	0.0
II	3		20.8	72.7	63.7
	2		4.1	0.0	9.1
	1		8.4	0.0	0.0
	0		66.7	27.3	27.2
III	3		37.5	45.4	63.7
	2		0.0	27.3	9.1
	1		16.8	27.3	4.5
	0		45.7	0.0	22.7
IV	3		0.0	0.0	0.0
	2		8.4	9.1	0.0
	1		45.7	72.7	77.2
	0		45.8	18.2	22.8
V	3		0.0	0.0	4.5
	2		8.4	18.2	0.0
	1		20.8	27.3	13.7
	0		70.8	54.5	81.8

Table 2 shows the average score made per exercise by pupils of the three grades tested, and the total average score made on the test by each grade. The percent of possible score reported shows that the third-grade children scored 31.6 per cent of what it was possible for them to score on the test, etc. The fifth grade scored only slightly over one-half of what it might have made in the test. These results may be taken as an indication that in spite of the apparent simplicity of the reading matter, and evident definiteness of the comprehension test, this test is to be considered rather difficult, or else it must be admitted that the pupils tested are not able to read understandingly content material of this sort.

TABLE 2

AVERAGE SCORES PER PUPIL, FOR EACH EXERCISE IN THE 'WHEAT TEST,' -  
ARRANGED BY GRADES

Exercise	Grade IV	V	VI
I	1.25	1.86	2.14
II	.79	2.19	2.10
III	1.80	2.19	2.14
IV	.54	.91	.78
V	.37	.64	.28
Total Average Score	4.75	7.29	7.64
Percent of Possible Score	31.60	48.50	51.00

A compilation of types of responses given the different exercises shows some astonishing variability. The outline map (Figure 1) shows the types of answers given by fourth-grade children in response to Exercise V. Figure 2, which embodies the results to the same question of sixth-grade pupils, shows considerable improvement. In these figures a star is placed wherever a pupil placed it in attempting to answer the exercise. The numbers appearing by the side of the stars indicate the number of children in addition to the one first placing the star in the location shown who gave the same answer.

#### SECOND EXPERIMENT: THE 'INDIANS TEST'

A second attempt at checking the silent reading comprehension of elementary school pupils was made. The material selected for this test was taken from *Iowa Stories*, a compilation of local history written by Dr. Aurner, of the State University of Iowa. This material is written in an easy, interesting style, and is read with much interest and enjoyment by children in the third grade. However, it was felt that the rigorous comprehension test was too difficult for children of this grade so the test was used in Grades IV, V, and VI.

In addition to the two paragraphs comprising the reading matter, the test consisted of a page of ten exercises asking for specific things to be recorded on the outline map of the state of Iowa which accompanied the other material. The children were then given the same directions as were used in the "Wheat Test." All pupils were given time enough in which to complete the test. The two paragraphs selected and the exercises based on it are here reproduced. They were also given outline maps like those shown on a reduced scale in Figs. 3 and 4.

#### 'PUSHING THE INDIANS OUT OF IOWA'

The Indians loved their hunting grounds along the eastern side of the Mississippi River and Chief Black Hawk wished to stay in the land where he was born. But the white people kept coming over the line between their land and the land which the redmen still claimed in Illinois. On the Illinois side of the big river were the corn fields of the Indian tribes and there the men and women and children had been allowed to live until trouble arose. Then the great war broke out which is known in history as Black Hawk's War, because that chief led the Indian warriors.





FIG. 1. RESPONSES OF FOURTH-GRADE PUPILS TO EXERCISE V.

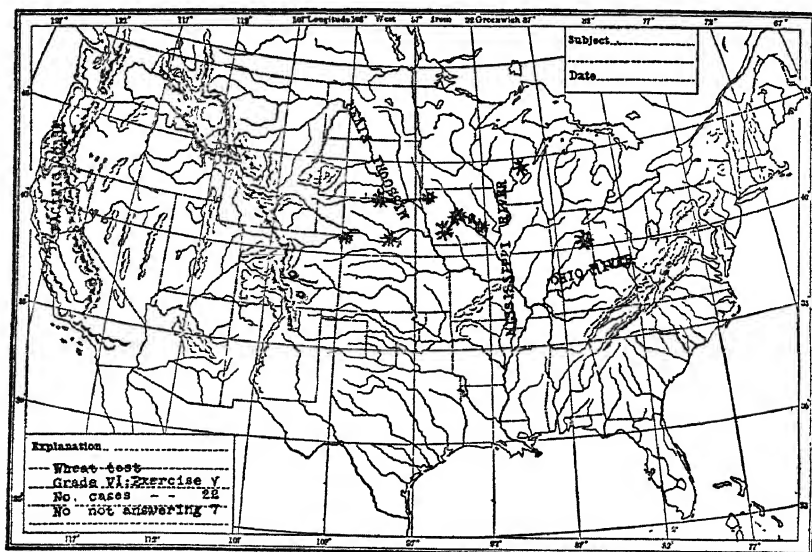


FIG. 2. RESPONSES OF SIXTH-GRADE PUPILS TO EXERCISE V.

When the bitter fight was ended, the Indians were defeated and, of course, the government of the United States made them give up some more of their land. At that time a strip about fifty miles wide along the west side of the Mississippi River, except for a narrow strip along the Iowa River near its mouth, was sold to the United States for about fourteen cents an acre. The narrow piece of land which the Indians kept on both sides of the Iowa River was the hunting ground of a part of the tribes. Within this land and about twelve miles from the mouth of the Iowa River, was the village of Chief Keokuk, who was one of the great leaders of his people. In 1836 the narrow strip along the Iowa River which had protected the village of Chief Keokuk was sold to the United States government for about eight cents an acre. Keokuk and his people moved away to other Indian lands further west.

“PUSHING THE INDIANS OUT OF IOWA”

1. Show the location of the favorite hunting grounds of the Indians by putting the letter “H” in the proper places on the map.
2. If Chief Black Hawk loved his land along the Mississippi River, write the word “Yes” along the bottom of the map.
3. Show the location of the corn lands of the Indians along the Mississippi River by putting the letter “C” in the proper places.
4. Enclose with a line the strip of land which the Indians first sold to the white people.
5. Anywhere within the first strip of land sold by the Indians to the white people, write the figures showing what price the Indians were paid for each acre.
6. Mark with crosses (xxxxx) the land along the Iowa River where the Indians kept their hunting grounds after Black Hawk’s War.
7. Place a star (\*) about where the village of Chief Keokuk was located.
8. Write near the village of Chief Keokuk the date when he sold the remaining strip of land along the Iowa River to the white people.
9. If Chief Keokuk received ten cents an acre for the last strip of land sold to the white people, put a circle around the date just written. If he received about eight cents an acre, put a line under the date.
10. Show by an arrow the direction Chief Keokuk and his tribes moved when forced to leave their village.

This test was given in two schools, the University Elementary School and a public elementary school. The papers were scored by the writer by the following key:

Exercise	Score	Basis
I	3	One or more “H’s” along the eastern side of the Mississippi River.
	0	No “H” properly located, no reply.

II	3	"Yes" along the bottom of the map.
	2	"Yes" along either side of map.
	1	"Yes" along top of map.
	0	No response, "paragraph does not tell."
III	3	One or more "C's" along Illinois side of Mississippi River.
	0	No "C" properly located.
IV	3	Line not cutting Iowa River inclosing area along Miss. River above and below Iowa River
	2	Line parallel to and west of Mississippi River cutting Iowa River
	1	Line parallel to Miss. River cutting Iowa River, but inclosing one-third or more of area of state between river and the line
	0	No response; line east of Miss. River, etc.
V	3	Number 14 within area inclosed by line and the Mississippi River
	0	No figure; or figure outside area; "paragraph does not tell"
VI	3	x's along both sides of Iowa River near its mouth
	2	x's along both sides of Iowa River, but not near mouth
	1	x's along one side Iowa River; not near mouth
	0	No x's; or along another river, etc.
VII	3	Star on Iowa River near its mouth within area marked as hunting grounds of Indians
	2	Star on Iowa River but outside this area
	1	Star near headwaters of Iowa River
	0	No star; or away from Iowa River; etc.
VIII	3	Date 1836 near star above
	0	Date not near star as in above; no date given
IX	3	A line under the date 1836
	0	A circle around the date 1836; no answer; etc.
X	3	Arrow starting near star pointing westward
	2	Arrow starting near star pointing southwest or northwest
	1	Arrow pointing north or south
	0	Arrow pointing east; no answer; etc.

TABLE 3  
AVERAGE SCORES PER PUPIL IN SCHOOLS A AND B FOR THE TEN EXERCISES  
IN THE 'INDIANS TEST'

Exercise	Grade School	Fourth		Fifth		Sixth	
		A	A	B	A	B	
I		1.4	2.3	2.85	2.6	2.07	
II		3.0	2.9	2.64	2.9	2.66	
III		2.8	2.7	2.50	2.5	2.72	
IV		1.1	1.0	.70	1.6	1.16	
V		2.1	2.7	1.46	2.4	2.00	
VI		1.4	2.1	1.26	2.1	2.16	
VII		1.3	1.6	1.23	1.9	2.67	
VIII		2.3	3.0	2.70	2.8	3.00	
IX		2.5	2.8	1.80	2.8	2.90	
X		1.9	2.2	1.60	2.5	2.28	
Total		19.8	23.3	18.74	24.1	23.62	
Percent of Possible Score		66.0	78.0	62.50	80.5	78.80	

Table 3 shows that a score of 1.4 was made on the first exercise on the average by fourth-grade pupils tested. This average score was increased to 2.3 by the fifth-grade pupils, and to 2.6 points by the sixth-grade pupils, etc. The average total score made by the fourth grade was 19.8 points, or 66.0 percent of what it was possible for the pupils to score. The fifth grade of School A made an average of 23.3 points, or 78.0 percent of the total possible score.

In this test, as in the former test, there are some interesting variations in difficulty of the exercises in the different grades. For example, the average score per pupil for the third exercise seems to indicate that it becomes more and more difficult as it advances through the grades tested. The final averages, however, show something of the expected grade growth.

In order to show something of the variation in the type of response given by fifth and sixth-grade children to this material Figures 3 and 4 are presented. In each case the map is an exact duplicate of the map used in the test. Figure 3 shows the types of answers given to Exercises VII and X by 35 fifth-grade pupils in School B.

If one may interpret these results somewhat freely, it may be said that the responses of the children tested by this type of test of comprehension literally do "scatter all over the map." In the light of these data, is it not logical to raise these two questions: Do children vary as widely in their comprehension of content material read silently as their responses to these tests seem to indicate? If such is the case, is it any wonder that we find the ignorance we do in certain of the content subjects?

To bring together the results of these tests, Table 4 is presented. The object of this table is to show at a glance how far the actual scores were from the highest possible score (100) in both tests, both schools, and in all three grades.

TABLE 4

Grade	IV	V	VI
Wheat Test (School A)	31.6	48.5	51.0
Indians Test (School B)	66.0	78.0	80.5
Indians Test (School B)	...	62.5	78.8

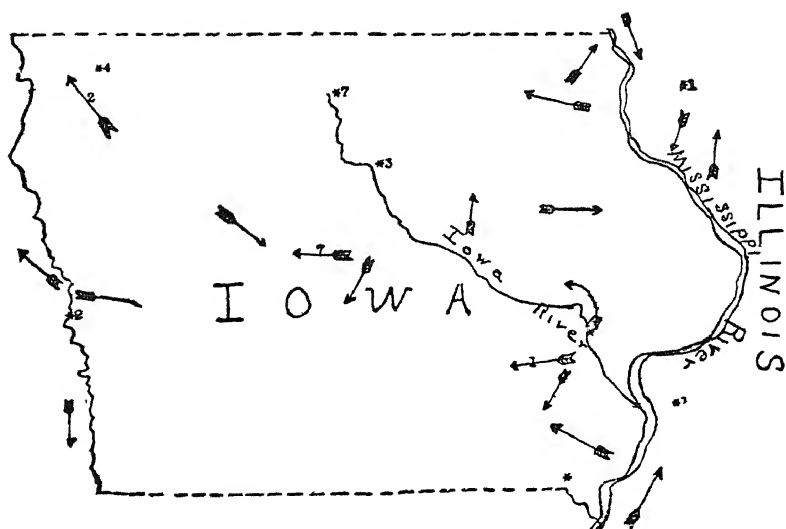


Fig. 3. Responses of 35 Fifth-Grade Pupils in School B to Exercise VII (asterisks) and Exercise X (arrows) in the 'Indian' Test. (No answer to Exercise VII by one pupil, none to Exercise X by six pupils. Numbers beside stars or arrows indicate number of pupils, in addition to the first one recorded, who made that response.)

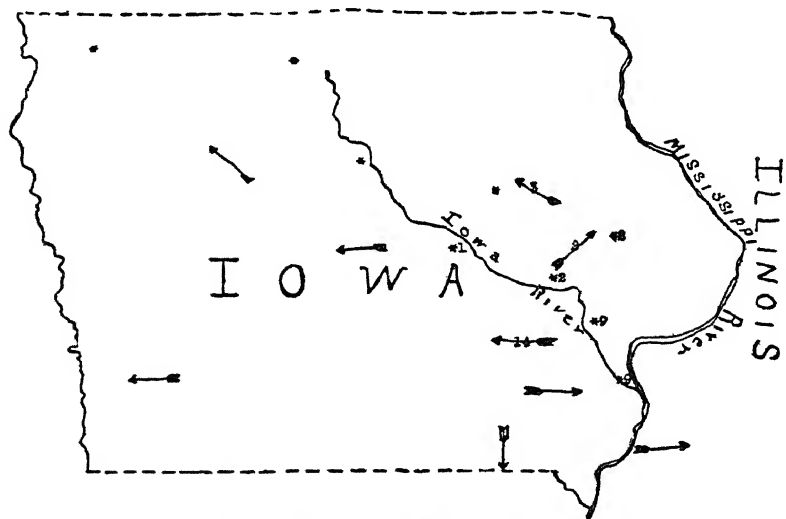


Fig. 4. Responses of 32 Sixth-Grade Pupils in School B to Exercise VII (asterisks) and Exercise X (arrows) in the 'Indians' Test. (No answer to Exercise X by four pupils. Numbers used as in Fig. 3.)

## SUMMARY

In summary, it seems that the work with these tests warrants certain conclusions, though these, because the data are too limited in number of cases and scope of material, are confessedly tentative conclusions. Further experimentation with this type of material is going forward.

1. Children read and glibly discuss certain content material placed in their hands, but when they are held strictly to account by an objective indication of comprehension, the scores made are startlingly low. Among the factors which may affect the results: (a) silent reading ability; (b) geographical knowledge; (c) mechanical features of the tests; (d) lack of motive on the part of the pupils.

In respect to the second factor, it may be said that, so far as it was possible, lack of geographical knowledge was discounted by placing on the map itself labels indicating most of the geographical knowledge required. There is no comment on the third factor, except to say that the same mechanical difficulties were presented to all grades and to all pupils tested. The question of motive needs no discussion. The children were interested, and practically without exception took special delight in undertaking the tests.

2. By the use of material such as is described in this study, an objective determination of the ability of school children to read and to understand certain selected content material may be made.

3. Material of a similar nature covering a large range of subject matter may be selected and prepared by teachers and supervisors with the aid of limited school equipment. Outline maps of the type used in these tests may be purchased in quantities from publishers or may be made by the teachers with a hektograph. The manifolding of all sorts of testing and teaching material is made possible through the use of it and similar devices.

4. Information of the sort revealed by these tests should be of great importance to teachers in connection with their regular class work. Assignments can be adjusted to the ability of the class, and a better understanding of the difficulties of the individual pupils of the class will result.

5. In view of the apparent inability on the part of our school pupils to read and comprehend accurately, material of the type which constantly confronts them in their daily lesson assignments, it is evident that we need much more emphasis on drill on content material for the purpose of developing this ability. Suitable material is easily found. Straightforward, factual material that permits close checking is best. Map and diagram material is excellent for drill purposes. Charts, graphs, and tabular presentations of facts are excellent, and certainly we encounter material of that type frequently enough to warrant special emphasis on it at the present time. Much use of unstandardized material for drill purposes is to be recommended

## CHAPTER IX

### THE VOCABULARIES OF TEN FIRST READERS<sup>1</sup>

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J. L. PACKER

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In the *Seventeenth Yearbook, Part I*, of this Society Mr. E. T. Housh, Superintendent of Schools, Carroll, Iowa, published a summary and analysis of the vocabularies of ten second-year readers. The present study is a similar investigation of the vocabularies of ten first readers from the following well-known series:

- |                       |                  |
|-----------------------|------------------|
| 1. Aldine             | 6. Heath         |
| 2. Beacon             | 7. New Education |
| 3. Brooks             | 8. New National  |
| 4. Carroll and Brooks | 9. Riverside     |
| 5. Cyr                | 10. Wheeler      |

Two tables are presented. The first is really a summary of the second; it indicates the total number of different words that appear in the ten readers with the frequency specified. This table will be useful in showing the number of words that need to be known in order to read various proportions of these readers as one proceeds from the words most commonly used toward the words that are least commonly used. It may be noted that of the 3,541 different words, 2,048 appear four times or less.

The second table specifies the words themselves in alphabetical order within descending frequency groups. It is to be interpreted thus: the word *the* is used 5,246 times in these ten first readers and is found in all ten of them, etc.

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<sup>1</sup>This study was undertaken by Mr. Packer when Superintendent of Schools at West Liberty, Iowa, and a graduate student in the State University of Iowa and was nearly completed when he died, January 19, 1918. In view of the many requests for the summarized lists which Mr. Packer was known to be preparing, the Graduate College made an appropriation for clerical assistance to complete the work, which was done by Dr. and Mrs. Harry Greene. The lists with a few words of explanation are transmitted for publication by Professor Ernest Horn.—*Editor*.



TABLE 1

SUMMARY OF THE NUMBER OF DIFFERENT WORDS OCCURRING WITH CERTAIN FREQUENCIES IN TEN FIRST READERS

Number Words	Frequency	Number Words	Frequency	Number Words	Frequency
15	700-5250	10	250-299	60	40-49
6	600-699	12	200-249	96	30-39
7	500-599	34	150-149	164	20-29
5	400-499	40	100-149	382	10-19
9	350-399	35	75-99	514	5-9
10	300-349	94	50-74	2048	1-4

TABLE 2

WORDS USED IN TEN FIRST READERS, ARRANGED ALPHABETICALLY BY FREQUENCY GROUPS TO SHOW THE NUMBER OF TIMES EACH WORD APPEARS AND THE NUMBER OF READERS IN WHICH IT APPEARS

Word	Frequency	Readers	Word	Frequency	Readers	Word	Frequency	Readers
	700 - 5250		has	350	10	away	186	10
the	5246	10	his	385	10	baby	182	9
and	3375	10	one	375	10	big	194	10
I	1929	10	so	355	10	bird	159	10
a	1869	10	there	371	10	by	174	9
to	1856	10	this	381	10	Dan	152	3
you	1859	10		300 - 349		down	176	9
is	1457	10	at	348	10	eat	188	10
it	1479	10	be	316	10	from	183	10
he	1015	10	go	304	10	get	181	9
in	1058	10	good	304	10	home	162	9
little	1037	10	how	334	10	house	173	10
she	804	10	some	335	10	into	173	10
will	855	10	them	312	8	know	198	10
not	732	10	then	317	10	man	158	9
of	707	10	tree	311	10	many	153	9
			your	311	9	mamma	153	4
	600 - 699			250 - 299		may	155	9
are	667	10	as	264	9	nest	173	10
do	693	10	had	278	10	oh	170	8
for	633	10	here	252	9	our	161	9
said	609	10	him	281	10	put	150	10
see	674	10	mother	276	10	red	184	10
they	680	9	no	253	10	run	191	10
	500 - 599		now	298	10	shall	168	9
can	562	10	out	251	9	sing	156	9
have	568	10	play	279	10	take	164	10
her	520	10	too	258	10	us	182	9
me	529	10		200 - 249		very	177	8
on	561	10	birds	205	9	want	151	7
we	565	10	bay	232	9	where	165	10
what	564	10	day	235	10	yes	157	9
	400 - 499		did	219	10		100 - 149	
like	450	10	make	206	10	again	106	9
my	429	10	must	211	9	blue	128	8
that	479	10	old	231	9	came	133	9
was	493	10	pretty	208	8	cat	148	8
with	427	10	think	207	9	could	118	10
	350 - 399		up	240	10	dear	105	8
all	380	10	when	243	10	does	129	10
but	358	10	would	232	9	dog	133	7
come	376	10		150 - 199		don't	134	6
			am	196	10	find	103	9
			an	157	10	fly	134	8
						Fred	117	6
						girl	122	9



Word	Frequency	Readers	Word	Frequency	Readers	Word	Frequency	Readers
walk	41	5	pan	33	4	eight	27	7
warm	46	8	party	39	5	Elsie	23	1
watch	40	6	picture	39	6	far	29	6
wheat	41	4	place	37	8	farmer	26	5
woods	45	7	plant	31	6	faster	21	4
			ring	33	5	feathers	28	6
			roses	33	6	fill	24	6
30 - 39			sea	39	5	first	23	6
along	30	6	sell	36	5	flew	29	6
around	39	8	sick	31	4	flower's	27	1
ate	30	3	side	36	8	food	23	6
bear	32	3	singing	35	7	funny	25	5
because	33	5	sits	32	6	George	26	3
began	36	2	stay	30	6	goes	23	3
bell	39	4	supper	30	4	gone	26	7
black	35	6	took	34	7	grandmother	27	3
blows	36	7	town	31	3	ha	22	2
box	36	6	train	31	4	Helen	28	5
butter	33	6	try	38	4	helped	20	3
buy	31	6	violet	38	5	hide	26	6
buzz	33	2	wanted	30	7	honey	23	4
calls	30	8	which	37	8	horn	21	5
care	32	7	while	33	7	hurt	22	5
carry	34	8	without	32	6	ice	28	5
chickens	37	6	write	37	6	ill	20	3
Christmas	38	7				isn't	27	2
clock	39	5	20 - 29			Jamie	25	2
cry	35	5	Alice	23	4	keeps	21	5
dogs	39	5	another	22	5	kite	26	5
door	34	4	ask	27	5	kitten	25	3
dress	32	5	basket	24	5	kitty	25	4
face	30	7	beat	21	5	knew	26	5
fat	32	7	bees	24	4	knows	23	9
feed	30	5	Bennie	21	1	lake	20	4
feel	33	8	Billy	28	1	lay	25	5
feet	36	8	bird's	22	3	leaf	23	7
fell	36	7	birthday	20	3	legs	24	7
fish	35	9	bite	26	4	light	24	8
five	31	6	blew	21	4	liked	20	4
flower	36	6	boat	24	6	looking	22	9
flying	34	5	books	23	4	Marion	25	2
Frank	39	4	bough	21	3	Mark	26	2
friends	30	5	how-wow	22	4	Mary	20	4
fruit	32	4	bridge	22	1	meadows	20	6
full	33	6	brings	23	7	meadow	27	5
gives	30	8	built	21	2	mean	20	2
goat	34	3	buttercup	20	3	might	24	6
goats	33	4	butterfly	23	7	mine	24	4
grandpa	36	5	cap	20	4	minute	21	3
gray	32	4	cart	24	5	Miss	27	3
grew	33	7	cats	28	4	most	23	3
gruff	32	1	cheese	23	2	Muffet	21	3
hard	35	7	chick	21	5	Nan	24	2
hawks	30	4	chicken	23	5	Ned	28	4
hay	30	4	chicks	20	4	Nell	29	2
ho	31	4	close	21	6	nests	23	7
hold	30	8	cook	26	4	nine	21	5
horses	36	6	country	26	6	north	28	6
hungry	32	5	cows	28	6	outside	28	5
kittens	39	4	cradle	25	3	pads	23	2
left	35	7	creep	27	4	pan-cakes	21	2
lily	35	3	cross	29	4	pat	23	5
lion	35	3	crows	27	3	people	23	3
lived	34	6	crying	20	4	pet	21	5
lives	30	8	days	29	8	pick	21	5
looks	35	7	didn't	23	2	pie	21	4
makes	38	8	dolls	24	6	pink	22	4
nice	32	5	donkey	24	3	played	28	3
nuts	39	7	drum	24	5	playing	27	7
oak	30	6	dwarf	21	2	plays	25	7
often	31	5	ears	28	5	pussy	27	4
open	37	6						

Word	Frequency	Readers	Word	Frequency	Readers	Word	Frequency	Readers
ready	25	5	beside	17	5	dry	13	2
river	20	6	bit	10	5	ducks	19	5
robin	27	5	black-smith	10	1	ear	14	5
room	23	7	blocks	14	3	east	16	8
roots	20	5	blossoms	13	4	eaten	10	2
Roy	29	1	blue-bird	17	3	eating	11	5
running	22	7	board	13	3	eats	13	7
runs	27	7	body	11	4	Edith	10	1
sail	20	6	both	12	4	egg	12	4
sang	22	5	boughs	13	3	else	13	3
seven	23	8	bow	12	6	engine	13	3
sharp	26	4	bowl	15	2	even	13	3
shining	24	5	breakfast	12	5	evening	13	4
ship	21	3	breezes	11	4	Esther	14	1
short	20	3	broom	10	1	eye	19	5
silver	22	4	brother	19	4	fairy	10	2
singer	27	1	brought	18	6	falling	12	4
sings	29	5	build	14	4	farm	18	6
sister	28	3	burn	12	3	farmers	16	2
six	28	7	busy	18	5	fear	18	4
sly	20	3	calf	10	2	fed	11	5
smell	20	2	candy	14	4	fellow	10	3
soft	29	6	caps	10	4	Fido	14	1
south	20	5	captain	14	4	filled	10	3
spin	25	5	car	13	2	fire	11	2
squirrel	21	2	careful	10	2	flies	14	5
squirrels	25	4	carried	12	4	floor	13	4
stand	27	6	cars	11	3	flour	13	4
stores	25	2	caterpillar	14	3	flow	13	4
story	25	6	caught	15	7	foot	10	3
swim	20	8	cents	11	2	fond	11	3
table	25	4	chair	19	4	forest	13	3
tail	21	5	child	13	5	Fred's	12	4
takes	22	7	city	10	4	fresh	13	7
talk	26	6	clang	17	2	friend	13	3
Tatty	20	1	claws	12	3	frost	14	4
Ted	28	2	clear	13	4	fur	10	3
thank	24	7	clouds	13	4	gather	17	5
throw	20	4	cluck	16	2	geese	19	2
through	22	5	coal	18	2	gets	14	6
tired	27	5	coats	10	5	gold	14	5
tramp	20	2	cock	19	3	golden	14	3
wait	26	7	colt	19	2	goose	14	3
wake	26	7	cookies	10	1	got	18	4
wall	21	7	corner	13	4	grain	14	4
wee	24	5	cotton	18	2	grand-mothers	16	1
west	23	5	couldn't	16	2	grand-pa's	11	3
wet	27	4	count	14	3	growing	13	5
wood	29	7	crab	12	1	grown	10	3
woodman	21	2	cream	10	4	grows	13	4
			creeps	10	3	guess	18	4
	10 - 20		cries	15	3	Gyp	15	1
air	19	5	cuddle	16	2	hair	13	6
almost	18	6	cup	14	5	half	11	2
anything	12	3	cut	10	4	half-chick	10	1
arm	13	4	daisies	10	3	Harry	18	4
arms	11	4	dance	11	3	hate	13	2
arrows	11	2	dandelion	16	3	having	11	5
asked	16	5	dark	18	7	hears	10	4
autumn	13	3	dash	10	1	herself	10	3
awake	13	4	deep	17	6	holds	16	5
baby's	10	6	den	12	3	hole	10	5
bark	19	6	diamond	12	4	hood	14	1
barked	14	4	dinner	11	4	Hood	15	1
bats	16	1	doctor	10	2	hop	18	5
bear's	15	1	doing	12	5	hoppity-skip	10	1
beauty	12	1	dolly	17	2	hot	12	4
begins	10	4	done	16	7	hour	13	3
behind	10	4	drake	11	1	houses	10	5
bench	12	2	draw	14	4	Indian	15	2
berries	13	2	dream	14	4	ink	11	2
						iron	10	2

Word	Frequency	Readers	Word	Frequency	Readers	Word	Frequency	Readers
Jenny	10	1	penny	11	3	spider	16	4
Jill	16	3	peep	14	6	spill	14	4
jump	16	3	pictures	13	4	spun	10	3
jumped	12	5	pies	10	2	stands	18	6
kept	16	5	plants	10	3	star	16	6
kill	15	4	plum	15	4	stars	15	4
killed	12	2	plums	12	4	stem	15	3
king	15	2	pocket	13	3	stick	17	4
knife	10	2	pole	10	2	sticks	11	3
lamb	12	3	poles	11	1	stile	10	1
lambs	10	5	porridge	15	2	stone	16	4
land	13	5	pot	17	3	stool	16	4
last	15	5	pull	11	4	stopped	12	4
laugh	13	3	puts	13	5	stories	15	5
learn	11	2	queer	14	1	street	10	6
leave	10	6	rabbits	19	4	string	19	4
Lee	13	1	race	11	3	stripes	19	2
Leon	18	1	reach	10	3	strong	15	3
letter	12	3	rice	10	2	sugar	15	3
lichen	17	1	Riding	17	1	summers	10	3
life	14	3	rill	16	3	sunshine	12	4
listen	16	4	ripe	18	5	suppose	12	1
load	10	4	road	11	3	sure	13	3
loads	10	3	robins	10	4	tea	11	3
loaf	10	3	rock	16	4	teach	16	4
lock	18	2	rock-a-bye	15	3	teeth	15	4
London	10	2	rocks	15	5	tells	19	6
longer	12	6	roll	10	2	that's	12	2
loose	11	1	rolled	10	2	thin	10	4
lost	18	5	rope	16	3	thing	13	6
loud	15	5	Rose	11	1	thinks	19	5
loves	10	4	row	11	4	those	11	4
low	13	4	rub-a-dub-dub	10	2	thought	18	6
luck	14	1	Ruth	15	3	tick	19	3
Lucy	12	1	safe	10	4	till	16	4
making	16	7	safely	12	3	times	19	6
malt	10	1	sailing	11	3	tiny	15	3
March	13	2	sailor	12	2	tip-top	10	1
market	11	2	sails	18	5	titty	15	1
mat	18	2	Santa	11	2	tock	10	3
May	17	1	Santa Claus	10	1	together	11	5
men	19	4	Saturday	12	3	tonight	10	2
merry	12	5	saying	11	3	touch	12	4
mew	11	3	season	10	2	traveler	10	1
nice	19	3	seat	17	2	tried	16	2
middle-sized	15	1	second	14	5	turn	13	4
mind	19	5	seed	13	4	turned	12	3
moon	14	4	seem	16	5	turtle	12	1
mothers	16	4	sees	19	6	uncle	12	2
mud	18	4	seemed	12	4	used	12	3
myself	16	4	seems	19	6	visit	19	5
names	11	4	sells	10	3	wagon	16	3
naughty	17	2	send	11	5	waiting	10	3
nearly	11	3	sent	15	4	web	14	2
neat	14	3	set	16	3	whooping	11	1
neck	11	3	shine	16	7	wicked	11	1
need	10	4	shines	14	5	willows	10	3
next	17	4	shoes	17	5	win	11	1
nibble	11	2	shoot	14	3	windows	10	5
none	10	4	sight	13	4	winds	15	6
nose	15	4	sir	10	2	Winnie	10	1
nothing	13	6	sitting	12	4	wise	10	3
ones	16	5	skate	11	3	wished	11	3
opened	11	6	skins	15	2	wolf	18	2
ought	12	3	sled	14	3	woman	11	3
own	19	4	sleeping	11	4	women	13	2
owl	11	2	sold	11	3	wonder	11	3
ox	14	1	soldier	12	2	wool	11	1
paint	12	2	soldiers	14	3	wow	12	2
Paul	12	1	song	18	7	wore	10	4
peas	11	2	sow	14	2	world	11	4
paper	14	3	speak	15	2	wouldn't	10	4

Word	Frequency	Readers	Word	Frequency	Readers	Word	Frequency	Readers
yard	15	4	cattle	5	3	felt	8	3
year	16	4	Charley	8	1	fence	9	3
years	15	4	chestnut	7	2	ferry	5	1
	5-9		chestnuts	5	1	fields	5	3
above	5	4	chief	5	1	fireman	5	3
act	5	1	chin	5	2	firemen	5	1
ah	6	2	choose	9	2	fisher	9	3
ails	7	2	churn	5	1	flat	7	2
Allen's	5	1	Clark	5	1	Flossie	9	1
alone	9	5	Claus	6	1	forget	8	2
among	8	3	clean	8	2	forlorn	5	1
animals	9	3	climb	9	3	form	5	3
Anna	8	1	climbs	7	2	forty	8	3
answer	6	2	cloak	8	1	fort	6	1
ant	7	2	clocks	5	2	frog	5	2
April	5	2	cloud	9	3	frolic	8	1
apron	7	1	clover	9	4	front	6	2
a-riddle	6	1	clovers	9	1	fruits	5	3
attic	5	1	clucker	7	1	gay	6	4
awoke	9	3	coast	6	2	gentle	5	2
ax	7	2	cock-a-doodle-do	7	2	gentleman	6	1
babies	5	3	colors	7	2	gills	5	2
bad	8	3	coop	5	1	given	5	3
bag	5	1	course	5	1	golden-rod	6	3
bake	9	3	cover	5	3	good-bye	7	3
baker	8	2	covered	6	3	goodnight	5	2
baker's	7	3	crack	5	2	grains	6	3
band	5	2	creek	5	1	grapes	6	1
bare	5	2	creeping	6	1	grind	7	1
barrel	5	2	crept	5	4	gun	6	1
beach	6	2	crown	8	3	hail	7	2
beans	6	1	crumpled	6	1	hammer	7	1
became	6	3	curds	7	2	handle	6	4
beef	5	3	daisy's	5	4	handsome	9	3
begin	8	4	dare	5	2	Hal	5	1
bells	8	3	Dan's	8	2	hark	7	3
bellows	6	1	dates	5	1	harm	9	4
Ben	8	1	doesn't	7	2	Harold	5	1
bill	5	2	Don	8	1	Harry's	8	2
birdies	9	3	Dotty	5	1	harvest	5	1
black-board	7	2	dove	6	2	hasn't	6	2
blades	6	2	dressed	9	4	hatch	5	1
block	8	3	drill	5	1	hats	5	3
blossom	8	3	drinks	5	3	haven't	5	2
Bo-peep	7	1	drives	8	4	hawk	8	2
bowls	7	2	drop	7	5	hay-cock	7	1
branch	5	3	dropped	6	3	heads	6	4
branches	7	3	drops	8	6	heart	6	4
brave	9	2	drove	5	3	heat	9	5
brayed	5	1	drowned	5	4	heavy	7	4
breaks	8	4	drowzes	8	1	heaven	7	4
breast	8	3	Duke	7	1	held	7	3
breathe	6	1	dust	6	3	helping	5	3
brightly	6	2	earth	7	3	helps	7	4
broke	7	3	Edna	7	1	hens	7	3
brooks	8	4	elm	6	2	hid	5	3
buds	7	3	end	7	4	hills	6	4
bugs	5	2	enough	7	2	himself	8	4
building	6	3	everywhere	6	4	hind	7	1
Bunting	5	1	everything	8	4	hive	7	2
burrs	5	1	faces	7	3	homes	7	5
bush	8	2	fair	7	2	hoo	5	1
bushes	5	2	fairies	7	2	hope	7	1
bushy	7	3	fallen	5	2	hops	8	2
cage	6	3	falls	8	6	horns	7	3
calves	6	1	Fan	9	1	Horner	7	1
candles	5	2	Fannie's	5	1	huge	9	1
carriage	5	2	Fanny	5	1	hum	6	1
Carl	6	1	farther	9	1	humming	6	3
carpenter	6	1	farmer's	5	2	hung	9	2
catches	6	2	fasten	6	2	hunting	5	2
			feelers	5	2	hurrah	8	2

Word	Frequency	Readers	Word	Frequency	Readers	Word	Frequency	Readers
hurry	5	2	napkins	7	1	Robert	8	1
I'd	9	3	needle	7	2	rolls	9	4
indeed	8	4	Nick	7	1	roof	8	3
Indians	8	2	nights	5	2	rooms	7	2
insects	8	2	noise	9	1	rooster	6	1
it's	8	2	nowhere	5	1	rows	6	3
Jack-on-a-stick	6	1	oats	5	2	sad	8	3
Jack's	5	2	o'clock	9	3	Sadie	9	1
Jane	6	2	October	5	1	Sally	9	1
Jean	7	1	o'er	5	4	Sam	7	2
joy	5	3	older	5	2	sap	7	1
July	5	2	orange	7	3	saved	7	2
jumps	5	2	oranges	7	1	scales	7	1
June	5	2	orchard	6	2	scold	5	2
Kate's	5	2	others	6	4	scratch	5	4
kid	5	1	Otto	7	1	serk	6	4
kindness	6	4	oven	8	3	selfish	5	2
kinds	7	2	overhead	5	3	seller	7	2
kings	5	1	owner	5	1	sets	5	2
kiss	8	3	pails	9	3	sew	5	1
kissed	6	2	paints	5	1	shade	5	3
kitchen	8	2	pasture	5	1	shake	9	3
lad	8	2	paws	7	3	shan't	9	1
laid	5	2	pay	9	1	shaven	9	1
lap	7	3	peach	9	2	shell	9	3
lark	7	1	peaches	6	2	she's	5	2
late	9	3	pear	6	2	shoe	8	3
learned	5	2	pears	7	2	shone	7	4
led	7	3	pans	6	2	shook	9	3
less	5	2	papoose	5	1	shop	6	2
letters	6	4	pens	6	2	showed	7	2
lets	7	5	peeped	7	3	shower	5	2
let's	7	1	picked	8	4	shut	6	3
lie	6	2	picnic	5	2	silk	6	2
lift	5	2	piece	6	2	skates	6	3
lifted	5	3	pigs	7	1	slate	6	2
lights	8	4	piggy	8	1	slates	5	2
lilies	6	3	pit-a-pat	8	1	sleds	6	3
limbs	6	2	plain	8	1	sleigh	7	1
limp	6	1	plate	8	4	sleepy	7	4
lips	7	2	plates	8	3	slowly	7	2
locket	5	1	playmate	6	4	smells	8	3
locks	8	2	playmates	5	2	smiled	5	1
log	7	2	pleasant	8	4	smiles	9	4
lonely	7	2	pleased	5	3	smiling	7	2
longed	5	2	pool	5	1	smooth	6	2
lose	8	4	pond	6	2	softly	6	3
louder	5	2	pony	6	2	somebody	5	1
Louis	8	1	pop-corn	5	2	sometime	9	1
lurkey	6	1	pours	7	2	songs	8	2
mag-pie	7	1	porch	6	1	sorry	9	3
maiden	6	2	presents	7	2	sound	6	4
maple	7	2	proud	6	2	speckie	7	1
maples	8	3	pruned	6	2	sped	5	1
March	5	1	pudding	6	2	spins	5	2
mate	5	2	puff	7	2	spot	5	2
mates	8	3	pulled	5	3	Spot	8	1
matter	8	3	puppies	6	1	squeak	9	1
means	9	2	push	6	2	stairs	6	1
meat	7	2	quickly	5	1	star-fish	7	1
meet	7	5	quick	7	2	stayed	5	4
mend	8	2	quiet	5	1	stems	5	3
milked	6	2	rains	6	4	step	8	4
Miller	8	1	reached	5	2	stir	5	2
minutes	8	3	reap	6	1	stockings	8	3
mother's	8	2	red breast	7	2	stockings	5	2
mouth	7	3	reindeer	5	1	stolen	7	1
mouths	5	2	ribbon	6	2	stood	7	3
motor	6	1	Richie	5	1	store	9	3
muddy	6	2	rides	9	5	stout	6	3
Muff	7	1	roar	6	1	stove	8	1
nails	7	2	Rob	6	1	straight	9	3

Word	Frequency	Readers	Word	Frequency	Readers	Word	Frequency	Readers
stranger	9	3	wig	5	2	August	3	1
stream	5	2	wild	9	2	aunt	2	1
stronger	5	2	Willie	9	2	autumns	1	1
struck	7	2	wing	5	3	awhile	1	1
stuck	6	1	wishes	6	3	axes	3	1
sun-beam	7	1	worked	9	4	baa	2	1
sweeps	9	1	worried	5	1	babe	1	1
sweets	7	2	wrap	9	1	backs	1	1
swimming	5	2	wraps	5	1	backward	1	1
swinging	6	3	yesterday	5	1	badly	1	1
swings	9	2	yet	8	3	bag-pipe	4	1
taking	8	5	York	5	1	bags	1	1
talking	7	3	young	7	1	baked	2	2
teacher	8	2	you're	7	3	bakes	2	1
thanksgiving	5	1	yourself	7	3	baking	1	1
that's	6	2				balls	3	3
thee	9	2				Ball's	2	1
themselves	6	2				bananas	2	1
there's	8	2				bang	2	2
thick	6	3	aboard	3	1	bangs	1	1
thinking	6	3	able	1	1	bank	4	2
third	6	2	ache	1	1	barns	1	1
thistle	6	2	acorn	4	3	barnyard	1	1
thumb	5	3	acorns	4	3	barrels	1	1
threw	6	2	active	2	1	basin	1	1
throne	5	1	acts	1	1	bashful	1	1
ticket	9	1	ado	1	1	baskets	3	1
tick-tock	8	2	added	2	1	bat	4	1
tight	6	2	admired	1	1	bathing	1	1
tin	6	2	against	3	2	bay	1	1
tip	6	3	ago	4	3	bays	2	1
toes	6	3	ahead	1	1	beads	1	1
tomorrow	5	2	ahoy	3	1	beak	1	1
tools	7	3	ail	4	1	beaks	1	1
toot	9	1	alarm	4	2	beam	2	1
tops	9	5	Alice's	4	2	bean-stalk	2	1
torn	5	2	already	1	1	bears	1	1
tossed	6	1	also	1	1	beard	1	1
tracks	5	2	amethyst	1	1	beast	1	1
trap	6	2	anchored	2	1	beaten	2	1
tree-top	7	2	anew	1	1	beats	1	1
trot	9	3	angels	1	1	beating	2	1
true	8	3	animal	1	1	beasts	1	1
trunks	5	2	Annie	3	2	beautifully	1	1
trying	8	3	Annie's	1	1	become	2	1
tuffet	7	2	answered	4	2	becomes	3	1
turkey	6	1	answering	1	1	beds	2	2
turnips	7	1	answers	1	1	bedside	1	1
turns	6	3	ants	1	1	bedtime	1	1
tweet	6	1	anvil	4	1	breast	2	1
twinkle	7	2	anyhow	1	1	beetle	1	1
use	7	2	anyway	1	1	beets	4	1
valentine	6	1	anywhere	3	3	bedroom	1	1
valentines	5	1	ape	1	1	bog	2	1
violets	8	3	apes	1	1	beggar	1	1
voice	7	3	appear	2	2	beginning	1	1
walked	7	1	applesauce	1	1	begone	1	1
walking	8	5	apple-tree	3	1	begun	1	1
war	8	2	aren't	1	1	behave	1	1
Washington's	6	1	a-riddle-ma-re	3	1	behaved	1	1
wasn't	7	3	ark	2	1	believe	4	1
watched	7	2	arrow	3	1	believed	1	1
wave	8	4	a-rub-a-dum-dum	1	1	below	3	3
waves	6	2	a-sailing	2	1	hend	4	2
weather	6	2	ashamed	1	1	bends	2	1
weep	7	1	ashore	4	2	Bess	4	1
we'll	8	3	aside	1	1	bending	1	1
why	7	2	asks	3	2	beneath	3	2
whistle	5	2	assist	1	1	bent	2	1
whiteface	5	1	aster	2	2	besides	2	2
whole	8	5	asters	2	2	Bess	1	1
wide	6	4	attend	4	1	Bessie's	1	1
			attended	1	1			



Word	Frequency	Readers	Word	Frequency	Readers	Word	Frequency	Readers
between	3	2	bubbles	2	1	chance	2	1
bicycle	1	1	bubbled	2	2	change	4	2
bigger	1	1	bubbling	1	1	chase	2	1
bin	3	1	buckles	1	1	chases	1	1
biscuit	2	1	buckwheat	1	1	chased	1	1
bites	2	2	bud	2	2	chat	4	1
biting	2	1	buffalo	2	1	chatter	1	1
bitter	1	1	bug	2	1	chattering	1	1
black-birds	2	1	buggy	1	1	chats	1	1
black-smith's	1	1	builds	3	1	cheat	3	2
blank	1	1	bumped	1	1	cheeks	3	2
blankets	2	1	bump	1	1	cheerful	1	1
blast	3	2	bunch	1	1	cherries	4	2
blaze	2	2	bunny	1	1	cherry	1	1
blazing	2	1	buns	3	2	cheer	2	1
bleat	2	1	Bunting's	1	1	children's	3	1
bleated	1	1	bureau	1	1	chill	3	2
bleates	2	1	buried	3	2	chills	1	1
bleeding	1	1	burned	4	1	chimney	1	1
blink	1	1	burning	3	1	chimneys	3	2
blinked	1	1	burst	1	1	chin	1	1
blinks	1	1	busily	1	1	chins	1	1
bloom	1	1	business	4	1	chip	1	1
bloomed	1	1	buttercups	3	2	chocolates	1	1
blossoming	1	1	butterflies	3	2	choke	1	1
blowing	4	3	buttered	1	1	chooses	2	1
blown	2	2	buttermilk	1	1	chopped	1	1
blue-birds	2	1	butts	1	1	Christmastide	1	1
Bluebirds	2	1	button	2	1	chuck	4	1
boar	1	1	buzzing	2	2	chuckled	1	1
boards	1	1	buzz-z-z	1	1	circus	3	1
boasted	1	1	cabin	1	1	citron	1	1
boatman	4	1	cake	4	2	clam	1	1
boats	4	3	caller	2	2	clams	4	1
Bobby	4	1	calling	3	2	clambered	1	1
bob-o-link	4	1	camp	4	2	clap	1	1
bobs	1	1	camping	1	1	clapped	1	1
boil	2	1	cane	2	1	claps	1	1
boiled	2	1	cans	1	1	Clark's	1	1
boiling	4	1	canvas	1	1	clay	3	1
bold	4	1	cannon	3	1	cleaned	1	1
bolt	1	1	cape	2	1	cleared	1	1
bone	1	1	caples	1	1	clears	1	1
boo	3	1	capless	1	1	click	3	1
bore	1	1	capers	1	1	clicked	1	1
born	1	1	capering	1	1	clmate	1	1
bother	1	1	caravan	1	1	climbing	1	1
bottom	3	2	caraway	1	1	cling	2	1
bought	3	1	capture	1	1	clinging	1	1
bounding	2	2	captured	1	1	clings	1	1
bow's	1	1	carefully	1	1	cloaks	2	1
bows	2	2	cares	2	2	closer	1	1
bow-wow-wow	1	1	Carlo	1	1	closet	1	1
bran	3	1	carries	4	3	closed	3	2
brand	1	1	camel	4	2	cloth	2	1
bray	2	1	camels	1	1	clothes	4	3
braying	1	1	case	3	1	clothing	2	1
break	4	4	castle	1	1	closing	2	1
breathed	1	1	cat-bird	1	1	cloudless	1	1
bride	1	1	caterpillars	4	2	clucked	1	1
brighteyed	2	1	cat-tails	1	1	clump	2	1
brink	2	1	caw	1	1	clumpity	1	1
bringing	1	1	caws	3	1	clumsy	2	1
broad	1	1	cease	1	1	coachman	1	1
broadcast	1	1	censed	1	1	cobblers	1	1
broken	2	2	Cecil	2	1	cocoon	1	1
broth	3	1	cent	1	1	coffee	1	1
brothers	2	1	chain	1	1	colder	2	1
brow	1	1	chains	1	1	colts	2	1
brunette	1	1	chained	4	1	commence	1	1
brush	2	1	chairs	4	2	comic	1	1
brushed	1	1	chamber	1	1	common	1	1

Word	Frequency	Readers	Word	Frequency	Readers	Word	Frequency	Readers
company	4	1	dandelion's	2	1	dreamed	2	1
cone	3	1	danger	2	1	dreamland	1	1
cones	1	1	darkness	1	1	dreams	1	1
cooked	1	1	darting	2	1	drearer	1	1
cooky	3	1	dashed	2	1	dreary	3	2
cool	4	2	date	3	1	drenched	1	1
cooling	2	2	daughter	2	1	dresses	1	1
cooper's	1	1	dawn	2	1	drew	3	2
cord	2	1	day's	2	2	dried	1	1
cords	2	1	daytime	1	1	drifting	4	1
core	1	1	deafness	1	1	drifts	1	1
corners	2	1	deal	4	2	drills	2	1
corn-popper	1	1	dearly	1	1	drinking	1	1
cost	1	1	death	1	1	dripping	1	1
cottage	2	1	December	3	1	driven	3	1
cottongin	1	1	decided	1	1	driving	1	1
couple	1	1	deeds	3	2	driveway	2	1
cousin	4	1	deeper	2	1	dropping	3	1
counting	1	1	deer	3	1	droop	1	1
countries	1	1	delight	1	1	drooped	1	1
country's	3	1	dells	2	1	droopeth	3	1
country-side	2	2	desert	1	1	drooping	2	1
courage	1	1	depths	1	1	drown	2	1
covering	1	1	desk	4	1	drummer	2	1
cozy	1	1	dew	3	3	drums	3	2
cracked	1	1	dews	1	1	dug	3	1
cracked	1	1	Dick	2	1	Dukes	1	1
cramp	1	1	dickory	3	1	dull	4	2
crane	2	1	die	3	2	dumb	4	1
crane's	1	1	digging	1	1	during	1	1
crash	1	1	digs	3	1	dustpan	3	1
crate	1	1	died	1	1	dusty	2	2
crates	2	1	dimple	3	1	Dunstan	1	1
crawl	3	2	dimpled	1	1	Dutch	1	1
crawled	2	1	dining	3	1	dwelt	3	2
crawling	1	1	dine	1	1	dying	1	1
creak	3	2	ding-dong	2	1	eager	1	1
creaked	3	1	din	1	1	eagerly	1	1
creaks	4	1	dip	1	1	early	4	1
crimson	3	1	dirty	1	1	earned	1	1
cripple	2	1	disappear	1	1	earnestly	1	1
crisp	2	1	dish	1	1	ease	2	1
croak	1	1	dishes	1	1	easily	3	2
croaks	3	2	displayed	1	1	Easter	2	1
crock	2	1	distance	1	1	easy	3	2
crossed	1	1	dive	2	1	eastern	1	1
crossing	1	1	dived	1	1	eaters	1	1
crow	2	2	divide	1	1	echoed	1	1
crowd	1	1	dizzy	1	1	Eden	2	2
crowded	1	1	dock	3	1	edge	1	1
crowned	2	1	dog's	4	1	either	1	1
crowns	2	1	dollars	3	1	eighteen	1	1
crumbs	4	1	dollie	1	1	eighty	1	1
Crusoe	1	1	doll's	4	2	elephant	1	1
crushed	1	1	dolly's	2	2	elephants	1	1
crutch	3	1	donkey's	1	1	elbows	1	1
cuff	1	1	doors	4	3	Elsie's	3	1
cuffed	1	1	doorway	1	1	emblem	1	1
cunning	2	1	doubt	2	1	Ellen	4	1
cups	3	2	dough	3	2	Emma	3	1
currant	1	1	downtown	1	1	ended	2	2
current	1	1	downy	2	1	engage	1	1
curled	1	1	Dr.	4	1	engines	2	1
curtains	2	1	drag	1	1	engineer	4	1
curtsy	1	1	dragged	1	1	ends	1	1
daffodils	1	1	dragging	1	1	enjoy	2	1
dainty	3	2	drank	4	3	Eva	3	1
dame	2	1	drawing	1	1	evenings	2	2
damp	1	1	draws	3	1	ever-green	2	2
danced	3	1	dreadful	1	1	everyone	1	1
dancing	2	2				everybody	2	2
dandelions	3	3				evil	1	1

Word	Frequency	Readers	Word	Frequency	Readers	Word	Frequency	Readers
Eskimo	4	1	flown	1	1	giant	1	1
Eskimos	4	1	fluffy	1	1	giants	1	1
expected	1	1	flutter	3	2	giant's	2	1
eyed	2	2	fodder	3	1	giddy	1	1
eggshell	1	1	fold	4	2	gifts	1	1
fabulous	1	1	folding	1	1	giggled	1	1
fail	2	1	follow	1	1	gill	2	2
faint	2	1	followed	3	2	gilded	1	1
fairest	4	1	following	1	1	gin	1	1
families	1	1	follows	3	2	giraffe	3	1
family	1	1	folks	2	1	girl's	1	1
fans	1	1	foolish	4	1	glee	1	1
fare	2	1	foot-stool	3	1	glistening	1	1
farthest	1	1	fonder	1	1	glorious	1	1
fashion	1	1	forehead	1	1	glory	1	1
fastens	1	1	forests	1	1	glow	1	1
fastest	1	1	forget	1	1	gnawed	2	1
fathers	1	1	forgets	1	1	gobble	1	1
father	1	1	forks	4	2	God	3	2
fault	2	1	forms	1	1	gong	2	1
fearless	1	1	forts	1	1	good-by	4	4
feat	1	1	fought	1	1	good-looking	1	1
feared	3	1	fours	3	1	goosey	2	1
feather	3	2	forward	3	2	gooseberry	1	1
February	3	1	fowl	1	1	gorgeous	1	1
feeding	1	1	fowls	2	1	gown	3	1
feeds	3	2	fox's	3	1	gnats	3	1
feelings	1	1	foxes	2	1	grand-ma's	3	2
ferry-boat	1	1	fragrant	2	1	grand-father	2	1
fetch	1	1	frail	2	1	grasses	2	1
fetched	1	1	Frank's	4	1	grassy	1	1
fever	2	1	frame	1	1	grate	2	1
fierce	2	1	Freddie	2	1	grateful	1	1
five	1	1	Freddie's	1	1	gravy	1	1
fifth	1	1	free	1	1	greatest	2	2
filling	1	1	freedom	1	1	green's	3	1
fills	2	1	freeze	4	1	greenhouse	1	1
finds	2	2	French	1	1	griddle	1	1
finger	2	1	freshness	1	1	groceries	4	1
fingers	3	1	Friday	2	1	grinds	3	1
finished	4	1	friendly	3	2	growl	3	1
fins	2	1	frighten	3	2	growled	3	1
finding	1	1	fright	1	1	grunt	1	1
finer	1	1	frightened	3	2	grudged	1	1
fires	2	2	frill	1	1	guide	2	1
firefly	1	1	frills	3	1	guns	2	1
fireside	1	1	frisked	1	1	hairs	3	1
fished	1	1	frisky	2	1	hall	3	1
fishes	2	1	fritters	1	1	ham	3	1
fisherman	2	2	fro	3	2	hams	2	1
fishing	2	2	frosting	1	1	hammers	2	1
fit	2	1	froth	1	1	handful	1	1
fits	1	1	frowned	1	1	handed	2	1
flags	2	2	frowns	1	1	handled	1	1
flakes	2	1	frozen	3	2	hang	2	1
flap	1	1	furry	1	1	hanging	3	2
flash	1	1	gabbling	1	1	hangs	3	1
flats	1	1	gaily	1	1	hall	1	1
fleece	1	1	gales	2	1	halls	1	1
flesh	2	1	game	1	1	Hal's	1	1
flip-flap	2	1	games	3	2	happen	1	1
fit	1	1	gate	4	2	happened	4	1
fits	1	1	gates	1	1	happiness	1	1
floating	1	1	gathered	1	1	happily	2	1
flock	1	1	gathers	1	1	harder	2	1
flooded	1	1	gathering	1	1	hardly	3	2
flog	3	1	gaudy	1	1	harness	3	1
floss	2	1	general	2	1	hash	1	1
flower-bud	1	1	generous	1	1	hath	1	1
flow'rs	1	1	gently	4	3	hatched	2	1
flowing	4	2	George's	2	1	haul	1	1
flows	1	1	getting	3	1	hay-field	1	1

Word	Frequency	Readers	Word	Frequency	Readers	Word	Frequency	Readers
heals	1	1	invite	1	1	lamp	4	2
healthy	1	1	Irish	1	1	lamps	1	1
heaps	1	1	island	1	1	landlord	1	1
hearing	1	1	itself	3	2	lands	4	3
hearts	2	2	I've	4	2	lane	3	1
heels	3	1	Jack-daw	1	1	lantern	1	1
Helen's	1	1	Ja	4	1	lanterns	1	1
heigh	3	1	jam	2	1	language	1	1
hello	4	1	James	1	1	lapped	1	1
he'll	1	1	Jamie's	3	1	larger	1	1
helper	1	1	January	1	1	latch	2	1
helpers	1	1	jar	3	1	later	2	1
Henry	1	1	jarred	1	1	laughing	1	1
heroes	1	1	jars	4	1	lazy	2	1
her's	2	1	jay	1	1	leader	1	1
he's	1	1	Jean's	1	1	leading	1	1
hey	4	1	jelly	2	1	Lee's	1	1
hiding	2	1	Jennie	1	1	leafy	1	1
higher	3	2	Jenny's	1	1	leafless	1	1
highest	3	2	Jessie	4	1	leak	2	1
hillside	3	2	Jessie's	1	1	leaking	1	1
hillsides	2	1	jig	1	1	leaked	1	1
hire	2	2	Jimmie	4	1	lean	2	1
hit	3	1	Jimmy	1	1	leap	1	1
hives	3	1	Jippy	1	1	leaps	2	1
holding	3	2	Joe	2	1	learning	2	2
holdeth	1	1	John	1	1	learns	1	1
hollow	1	1	jokes	1	1	lease	2	1
homely	3	1	jolly	3	2	leased	1	1
homelike	3	1	joke	2	1	leaving	2	2
homeless	1	1	jog	1	1	leaving	1	1
homemade	1	1	juice	4	1	leaped	1	1
honey-bee	1	1	juicy	1	1	leg	4	2
honey-bees	2	1	jumping	1	1	leg's	3	2
hong	4	1	jewels	1	1	lend	4	2
honk	4	1	jewelry	1	1	length	1	1
Hood's	1	1	Jewish	1	1	lesson	1	1
hook	3	1	kangaroos	4	1	lessons	1	1
hoop	2	1	Katy	1	1	liberty	2	1
hoops	2	2	keeping	3	2	lick	1	1
hopping	2	2	kennel	1	1	licked	2	2
Horner's	2	1	kernel	3	1	licking	1	1
horrid	1	1	kettle	2	1	lid	1	1
horse-car	1	1	key	2	1	lifts	1	1
horse-shoe	1	1	ki-i	2	1	lightened	1	1
hospital	1	1	kicked	1	1	lighthouse	1	1
hotter	2	1	kilt	2	1	limping	1	1
hours	4	1	kindly	1	1	line	4	2
house-keeper	1	1	kills	2	1	Lina's	1	1
howl	1	1	killings	1	1	lingered	1	1
howled	1	1	kisses	1	1	lions	1	1
however	2	1	kites	1	1	lion's	2	1
hoy	1	1	kitten's	2	1	lip	1	1
Hubbard	1	1	Knapp	2	1	lips	1	1
humble	1	1	knee	4	2	listened	1	1
hum-m	4	1	knits	2	1	listening	1	1
humming-bird	2	1	knitting	3	1	list	3	1
hunter	1	1	knives	4	1	listing	1	1
hunts	1	1	knelt	1	1	litter	1	1
hunt-the-slipper	1	1	knock	1	1	litters	1	1
hush	2	1	knocked	1	1	lit	1	1
hut	1	1	knocking	1	1	living	1	1
hymns	1	1	knowledge	1	1	lively	2	1
Ickory	1	1	known	1	1	liveliest	1	1
improved	1	1	labor	1	1	loaded	2	1
immense	1	1	ladder	3	1	loaves	1	1
indigo	2	1	lady	1	1	lobster	4	1
indoors	1	1	lady-bug	1	1	logs	3	2
insect	2	1	lady's	1	1	loosened	1	1
inside	4	2	lain	2	1	lot	4	2
intend	1	1	lambskin	4	1	loved	3	3
instead	1	1	lame	2	1	lovely	2	2
						loving	1	1

Word	Frequency	Readers	Word	Frequency	Readers	Word	Frequency	Readers
loveth	3	1	mocks	2	1	Nichols	1	1
lower	2	2	mocking	1	1	nicer	1	1
lox	4	1	modest	1	1	nicest	1	1
lullabies	1	1	mold	3	1	night-cap	3	1
lullaby	2	1	Molly	3	1	ninety	1	1
lumber	3	1	Molly's	1	1	night-gown	1	1
lunch	4	2	moment	1	1	ninth	1	1
lungs	3	1	money	1	1	nips	2	1
lying	3	1	moo	2	1	nobody	1	1
Mabel	3	1	month	1	1	nod	2	1
Mack	4	1	months	2	1	nodded	3	2
Mack's	2	1	monster	1	1	nodding	2	1
main	2	1	moonlight	2	2	nods	1	1
managed	1	1	Moore	3	1	nook	1	1
man's	2	1	Moore's	2	1	nor	1	1
mamma's	3	2	mop	2	1	noses	3	1
manners	1	1	morn	3	2	noses's	2	1
marble	1	1	morning-glories	2	1	note	1	1
marbles	4	2	mornings	3	2	notion	1	1
marched	1	1	moss	3	2	November	4	1
marching	1	1	mosquito	2	1	numb	1	1
Mark's	3	1	mosquitos	3	1	numbness	1	1
marrow	1	1	mosses	1	1	nursery	1	1
married	3	1	mound	1	1	nut	3	3
Mary's	1	1	mourned	2	2	nutting	1	1
mask	4	1	mouse	1	1	oaks	2	2
mast	1	1	mountain	1	1	oatmeal	1	1
mats	4	2	move	4	1	obey	4	2
Mayflower	1	1	moved	1	1	object	1	1
May's	2	2	mowing	2	1	ocean	1	1
meal	4	1	mows	3	1	odd	3	1
meals	2	2	muffin	1	1	oddly	2	1
meaning	1	1	munching	1	1	offer	2	1
meant	4	2	music	2	1	oft	2	2
mechanic	3	1	musik	1	1	oho	2	1
medal	3	1	mustn't	1	1	omit	1	1
meeting	1	1	muscles	1	1	omelet	1	1
meets	2	2	mutton	2	1	oe-oo	3	1
melt	3	1	nail	2	2	Oh	1	1
melted	3	2	nailed	3	1	o-oh	1	1
melting	2	1	named	3	2	opens	4	2
mending	2	1	namesake	2	1	orchards	3	1
mends	1	1	Nanny	1	1	ore	1	1
merrily	1	1	Nan's	2	1	organ	3	1
merry-go-round	4	1	nap	3	1	orphans	2	1
mewing	1	1	napkin	2	1	ostrich	1	1
middle	4	2	narrow	4	1	ounce	1	1
mighty	2	2	Nat's	1	1	outer	1	1
mile	3	1	native	2	2	out-of-doors	1	1
miles	4	2	nearer	1	1	outdoors	1	1
mild	2	2	nearest	1	1	overboard	1	1
milk-can	1	1	neatest	1	1	owls	4	1
milk-man	1	1	neatly	3	1	owned	1	1
milks	2	1	necks	2	1	owners	1	1
milkweed	1	1	Ned's	1	1	owning	1	1
milkpail	1	1	needed	1	1	owns	1	1
Milton	2	1	needlecase	1	1	overflowed	1	1
miner	3	1	needs	3	2	pace	2	1
miners	2	1	negro	1	1	pack	2	2
mischief	3	1	negress	1	1	package	1	1
mischievous	1	1	neither	1	1	pad	1	1
missed	2	2	Nell's	1	1	page	3	1
misses	1	1	Nelly	1	1	pages	1	1
mis-givings	1	1	Nero	4	1	pain	4	2
mistaken	1	1	nestle	1	1	painted	2	2
Mister	1	1	net	3	1	painter	1	1
mistress	2	1	new-mown	1	1	palace	3	2
mirrors	2	1	news	2	2	pale	2	1
mite	2	1	nibbles	1	1	pair	2	1
Minnie	3	1	nibbling	2	1	pairs	1	1
mittens	3	2	Nick's	1	1	parrot	1	1
moans	2	1	nickle	1	1	pass	2	2

Word	Frequency	Readers	Word	Frequency	Readers	Word	Frequency	Readers
passed	2	1	plucked	1	1	ralling	1	1
passes	2	1	poke	1	1	rall	3	1
passing	1	1	poker	2	1	rainbow	4	2
past	1	1	pokers	1	1	raindrop	2	1
pat-a-cake	4	2	pockets	2	1	raindrops	4	3
paten	2	2	pod	2	1	rag	1	1
patted	2	2	pods	3	2	raining	3	2
pattering	1	1	polite	1	1	rainy	1	1
path	1	1	pollen	4	1	rains	1	1
Paul's	2	1	poll	1	1	raises	1	1
pauper	2	1	pondered	1	1	rake	4	2
paveless	1	1	ponies	1	1	raked	1	1
Payne	2	1	popped	3	3	rakes	1	1
Payne's	1	1	popper	1	1	rank	2	1
peace	2	2	pops	2	1	ranks	2	1
peaceful	2	1	poppies	1	1	rapped	1	1
pecked	2	1	poppy	3	1	raps	1	1
peel	2	1	pork	3	1	rare	1	1
pains	1	1	post	1	1	rather	8	1
papa's	4	2	post-master	3	1	rats	2	2
park	4	1	potter	2	1	raw	1	1
parlor	2	1	potatoes	1	1	Ray	1	1
part	3	1	pour	4	2	rays	2	2
parts	2	1	pound	2	2	reader	1	1
pan	4	1	pout	2	2	reading	1	1
peeping	3	1	pots	2	1	reads	4	2
peeps	1	1	powder	3	1	real	1	1
peevisish	1	1	power	1	1	really	1	1
pelt	1	1	powerful	1	1	reaped	2	1
perhaps	3	2	praise	1	1	rear	2	1
petals	1	1	praised	3	1	reared	1	1
petted	1	1	prank	1	1	reason	1	1
Peter	4	1	pranks	1	1	reckon	1	1
pick-ax	1	1	Pratt	2	1	red-den	1	1
pick-axes	1	1	pray	3	1	red-hot	1	1
picking	4	2	prayeth	1	1	reins	3	1
pickles	1	1	preach	2	1	relish	2	1
picks	1	1	present	3	1	remedy	1	1
pieces	1	1	presses	1	1	remained	1	1
pigeon	1	1	prettiest	1	1	removed	1	1
pile	3	2	price	3	2	rend	2	1
piled	2	1	prick	4	1	replied	3	2
pillow	2	1	pricked	1	1	resting	2	2
pills	3	1	pride	1	1	rested	2	2
piled-up	1	1	priest	3	1	rests	2	1
pilgrims	1	1	primmer	2	1	refresh	1	1
pimple	1	1	problem	1	1	rice-bird	1	1
pin	1	1	prowling	1	1	rich	1	1
pine	4	2	provoked	1	1	riding	3	1
pinks	3	1	puddles	1	1	Ridinghood	1	1
pins	3	2	pulling	1	1	Ridinghood's	1	1
pippins	4	1	pulls	2	2	riddle	3	1
pitcher	1	1	pump	2	1	riddles	3	1
pity	1	1	pup	2	1	rills	1	1
placed	2	2	puppy	3	1	rim	1	1
places	4	2	puppy's	1	1	ringing	4	2
plainly	3	2	pure	1	1	rings	1	1
plan	4	2	purrr	1	1	ring-tag	1	1
plane	3	1	purse	3	1	rinsed	1	1
planes	1	1	pushed	4	2	ripen	1	1
plank	4	1	pushes	1	1	ripening	1	1
planning	1	1	putting	1	1	rise	2	1
plans	1	1	quack	4	1	rivers	1	1
planted	1	1	queen	1	1	river's	1	1
planting	2	2	quietly	4	1	roars	4	1
playful	1	1	quill	4	1	roared	1	1
play-place	1	1	quite	3	1	roaring	1	1
playthings	3	1	racers	1	1	roadside	1	1
playthings	3	1	racers	2	1	roast	3	2
pleasantest	3	2	racing	2	1	roasted	1	1
pleases	2	2	rack	1	1	Robert's	4	1
plenty	3	1	rails	1	1	Rob's	1	1

Word	Frequency	Readers	Word	Frequency	Readers	Word	Frequency	Readers
robe	1	1	Scotch	2	1	showman	1	1
robin's	4	2	Scotchman	3	1	shows	4	3
rocked	4	2	Scotland	3	1	shouldn't	3	2
rocker	2	1	Scotland's	1	1	shrill	3	1
rocking	3	2	Scott	2	1	shuffled	1	1
rockinghorses	1	1	scour	1	1	shuts	3	1
Robinson	1	1	scoured	1	1	sicken	1	1
rode	4	1	scout	1	1	sickness	1	1
rogue	2	1	scouts	1	1	sides	2	1
rolling	2	2	scraps	1	1	side-walk	1	1
romp	3	1	scratched	3	2	sift	1	1
romping	1	1	scream	1	1	sifter	1	1
romps	2	1	screeched	2	1	sigh	1	1
rooting	1	1	seabird	1	1	sighed	3	1
ropes	2	1	seahorse	1	1	sighs	4	1
rosy	2	1	seals	1	1	silky	2	1
roughly	1	1	search	2	1	still	1	1
rounded	2	1	searching	2	1	silly	2	1
Rover	3	3	sea-song	1	1	simmering	1	1
rowboat	1	1	seashore	4	2	Sim	1	1
rowed	3	2	seashells	1	1	Simmons	2	1
rowing	1	1	seated	1	1	simple	1	1
Roy's	2	1	seats	2	1	since	1	1
rubies	1	1	sea-worms	1	1	sink	1	1
rubbed	1	1	seedling	1	1	sinking	1	1
rubber	2	1	seeing	1	1	sip	1	1
rude	1	1	see-saw	1	1	sisters	4	2
rudely	1	1	selling	1	1	sister's	2	2
rush	2	2	sends	4	2	sixty	1	1
rushes	1	1	sense	1	1	skating	1	1
rushing	4	2	September	3	1	skies	1	1
Russel	1	1	servant	1	1	skim	2	2
rustling	3	1	setter	1	1	skimmed	1	1
Ruth's	1	1	settle	1	1	skimmer	1	1
rhyme	1	1	several	1	1	skin	1	1
sack	1	1	sewing	3	1	skip	3	2
sacks	3	1	Shafto	3	1	skipping	2	2
safest	1	1	Shafto's	1	1	slap	4	1
sago	1	1	shakes	2	1	slaps	2	1
sailboat	1	1	shaking	1	1	slats	3	1
sailboats	1	1	shades	2	1	slay	3	1
sailed	1	1	shallow	2	1	soak	1	1
salad	1	1	sham	1	1	soaked	1	1
Sally's	1	1	shams	1	1	sob	1	1
salt	3	1	shape	1	1	sod	1	1
salute	1	1	shaped	1	1	soldiers	1	1
saint	1	1	shapes	1	1	solid	2	1
same	3	2	shear	1	1	somebody's	1	1
Sanders	2	1	shears	1	1	someone	1	1
Sammy's	1	1	sheds	2	1	somewhere	2	1
sank	1	1	shelter	4	1	sore	1	1
sash	1	1	she'll	3	2	sorrowful	1	1
satins	1	1	sheep's	3	1	sold	1	1
sauce	1	1	sheets	1	1	sole	1	1
save	1	1	shepherd	4	1	soundly	1	1
saws	1	1	shepherds	1	1	sour	1	1
sayings	1	1	shin	1	1	sowed	1	1
scale	1	1	shined	3	2	sowing	1	1
scamp	1	1	ships	4	2	space	2	1
scamper	1	1	shivering	2	1	Spain	1	1
scampered	1	1	shock	1	1	Spanish	3	1
scampering	1	1	shod	3	1	spark	1	1
scared	2	2	shoots	1	1	sparks	2	1
scat	3	1	shorn	3	1	speaking	1	1
scatter	2	2	shoulder	1	1	speaks	3	1
scattered	1	1	shoulders	1	1	spear	1	1
scatters	1	1	shout	2	2	spears	1	1
scent	2	1	shouted	1	1	sped	1	1
scepter	2	1	shouts	2	1	speed	1	1
scolded	1	1	show-case	1	1	spend	2	1
scolds	1	1	showers	4	3	spends	1	1
score	1	1	showery	1	1	spent	1	1

Word	Frequency	Readers	Word	Frequency	Readers	Word	Frequency	Readers
spice	3	2	sulkily	1	1	though	2	2
spiders	2	1	sum	1	1	thousand	1	1
spied	1	1	sun-beams	3	2	thumbs	2	1
spike	1	1	Sunday	1	1	three-legged	1	1
spilled	4	2	sung	2	1	throat	1	1
spins	1	1	sunlight	4	2	throwing	2	1
spines	4	1	sunning	1	1	thrushes	1	1
spinning	2	1	sunny	4	2	thrust	1	1
sprits	1	1	surely	2	2	thunder	1	1
spit	2	1	surprise	3	2	thundered	1	1
splash	1	1	swam	2	2	thus	3	3
spoons	4	1	swarm	1	1	thumped	1	1
sport	3	1	sway	1	1	thy	3	2
sports	3	1	swaying	1	1	thyme	1	1
spout	3	2	sweet	4	3	ticked	1	1
spread	2	1	sweeter	2	1	tickets	1	1
springs	2	2	sweetly	2	2	ticks	3	2
springtime	1	1	swell	2	2	tide	3	1
springtimes	1	1	sweet	3	2	tied	1	1
spruce	2	1	swift	1	1	tightly	1	1
spy	4	2	swiftly	2	1	tilt	1	1
squaw	3	1	swims	1	1	Tim	2	1
stable	1	1	swords	1	1	timid	2	1
staid	1	1	syrup	3	1	tinkling	1	1
stalks	1	1	Tabby	1	1	ting	2	2
stall	3	2	table-cloth	1	1	ting-ling-a-ling	1	1
stalls	1	1	tables	1	1	tins	3	1
stamped	1	1	tacks	1	1	tipped	1	1
standing	3	3	tadpole	2	1	tip-toed	1	1
start	2	1	tag	4	2	tire	2	1
started	1	1	tailor	1	1	tires	1	1
state	4	2	tailors	1	1	'tis	3	1
states	2	1	taken	4	2	toad	2	1
station	3	1	tale	3	2	toe	1	1
staying	1	1	tales	3	2	toiled	1	1
stays	3	3	talked	1	1	toilers	2	1
steady	1	1	talks	1	1	tolling	1	1
steal	2	1	taller	2	1	Tommy	2	1
steamers	2	1	tallow	1	1	Tom's	4	3
steamships	1	1	tame	1	1	tones	1	1
steed	1	1	tangle	2	1	tool	1	1
steel	2	1	tapping	2	1	tore	2	1
steep	2	1	task	1	1	toss	3	1
steeple	1	1	taste	4	2	toward	4	2
stepped	1	1	tattered	3	1	towel	1	1
steps	1	1	tastes	2	1	toy	1	1
sticking	1	1	tatoo	2	1	toys	4	2
stiff	3	1	taught	3	2	track	3	2
stingy	1	1	teaching	2	1	trail	2	1
sting	4	2	teapot	1	1	trails	1	1
stitching	1	1	tears	1	1	tray	1	1
stock	2	1	tease	3	2	treat	2	1
stones	3	3	Ted's	1	1	treats	1	1
stoop	1	1	telling	4	3	treasure	2	1
stopping	3	2	tend	2	2	tree-tops	2	2
stops	3	3	tended	1	1	tricked	1	1
stored	1	1	tender	2	1	tricks	4	1
storekeeper	3	1	tends	2	1	tries	4	1
storm	1	1	tent	1	1	trill	2	1
strangest	1	1	teats	1	1	trills	1	1
stray	1	1	thank	2	2	trimmed	1	1
streams	1	1	thanks	2	2	trims	1	1
stretched	1	1	thaw	3	1	trip	3	1
strike	1	1	thaws	1	1	tripping	1	1
strings	4	2	theater	1	1	tropical	2	1
stripe	1	1	their's	1	1	trotted	2	1
stroll	1	1	they'll	1	1	trots	3	2
stump	1	1	they're	1	1	trousers	1	1
stung	1	1	thimble	2	1	tug	2	1
suddenly	1	1	thirsty	3	1	tumbled	1	1
suffer	1	1	thirteen	2	1	tumblers	1	1
suffered	1	1	thistles	3	1	tumbling	1	1



Word	Frequency	Readers	Word	Frequency	Readers	Word	Frequency	Readers
Turkey	1	1	walls	4	3	whittled	1	1
turning	3	3	walnut	3	2	whiteness	2	1
turnip	2	1	wander	1	1	whose	1	1
twelve	1	1	wanders	2	1	wick	1	1
twig	3	3	warmed	3	1	wife	3	2
twill	1	1	warmer	3	2	wigwam	3	1
twilling	1	1	warms	1	1	wildly	1	1
twin	1	1	warmth	1	1	wildwood	1	1
twine	1	1	warm	1	1	willing	4	3
twins	2	1	washes	1	1	willingly	1	1
twists	1	1	waste	1	1	willow	1	1
'twould	1	1	watches	2	2	Will's	1	1
ugly	1	1	watching	3	2	willy	1	1
umbrella	2	1	water-cresses	1	1	windmill	3	1
uncles	1	1	watered	2	2	window-pane	1	1
underneath	1	1	waters	4	1	windy	2	2
understand	1	1	water-melon	1	1	Winkie	4	1
unfairly	1	1	watermill	1	1	Winnie's	2	1
unkindness	1	1	water-pail	1	1	winters	2	2
upper	2	2	waved	1	1	wipe	3	1
upset	2	1	waving	1	1	wisest	1	1
upsetting	1	1	wax	2	1	witch	2	1
upstairs	4	2	ways	2	2	withdrew	1	1
upside	1	1	weak	2	1	withier	1	1
upward	1	1	weary	2	1	withered	1	1
urchin	2	1	weave	2	1	within	1	1
urchins	2	1	web-feet	1	1	woke	3	1
unto	1	1	webs	1	1	won	2	1
useful	1	1	we'd	1	1	wonderful	3	2
uses	1	1	weed	1	1	wooden	4	2
utensils	1	1	weeds	1	1	woodland	1	1
vain	1	1	wee-haw	2	1	woodman's	1	1
valley	1	1	week	3	2	woodmen	3	1
van	2	1	weeks	3	1	woodmice	3	1
vase	2	1	welcome	2	2	words	4	3
vegetables	3	1	welcomed	1	1	worker	3	1
veins	2	1	wells	1	1	working	4	3
velvet	1	1	wend	1	1	works	4	4
vest	3	1	wept	4	3	worm	3	1
viewed	1	1	we're	1	1	worms	2	1
vines	1	1	wetter	2	1	worn	1	1
visited	1	1	wetting	1	1	wreath	3	2
visits	2	2	wets	2	1	wonad	2	1
vessel	1	1	whatever	1	1	wreck	1	1
vessels	1	1	whats	3	2	wrecks	1	1
wade	1	1	wheel	1	1	wren	1	1
waded	3	2	wheel-barrow	2	1	wren's	1	1
wages	2	1	wheels	2	1	wrestled	1	1
wagging	1	1	whenever	2	2	wrists	1	1
wagons	1	1	wherever	1	1	writing	1	1
waist	1	1	where's	1	1	written	2	1
waited	3	3	whichever	3	1	wrong	1	1
waiter	4	1	whined	1	1	yarn	3	1
waits	2	1	whipped	1	1	you'll	2	2
waked	1	1	whisper	1	1	yours	3	2
wakened	2	2	whispered	1	1	you've	2	2
wakes	2	1	whistled	1	1	zeal	1	1
walks	4	3						

## CHAPTER X

### THE CONTENTS OF READERS

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#### THE PROBLEM

The problem of this investigation was to determine, first, to what extent current textbooks in reading agreed or differed (*a*) with regard to the nature of the material included and (*b*) with regard to specific pieces or selections; and second, to what extent there are changes or differences in the nature of the material from the first grade to the eighth grade. This problem is important in connection with the larger problem of determining what the content of readers should be. A considerable amount of work has been done on similar problems in other fields, notably in spelling and arithmetic. Little has been done in the field of reading. The problem also has an important bearing on the choice of readers for schools.

#### MATERIALS AND METHOD

The present investigation<sup>1</sup> was carried out by making an analysis of the contents of ten textbooks used in each of the eight grades.

In the following list of readers analyzed, the numbers in parentheses are the dates of publication, and the numbers following the parentheses are the grades of which the texts were analyzed:

Aldine (1916), 1, 2, 3.  
American Literary, 8  
Baldwin and Bender (1911), 1 to 8.  
Blodgett (1910), 2 to 7.

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<sup>1</sup> This work was carried out with the co-operation of Miss Elizabeth A. Garrity, Miss Katherine T. Larkin, Mr. H. A. Boyle, Miss Margarita E. Burns, Miss Helen L. Button, Miss Anne Green, and Miss Faith D. Thayer, members of the writer's course in the Psychology of School Subjects in the summer session of Harvard University, 1920.

Brooks (1906), 3 to 8.  
Carroll and Brooks (1911), 2 to 8.  
Child Life (1900), 1, 3.  
Cyr (1904), 2.  
Edson-Laing (1913), 1, 2.  
Elson (1909, 1913), 1 to 8.  
Golden Rule (1912), 4 to 8.  
Golden Treasury (1909, 1912), 1, 2.  
Graded Literature (1900), 3 to 8.  
Halburton (1912), 8.  
Heath (1903), 3, 6.  
Holton-Curry (1912), Primer and First Reader.  
Horace Mann (1915), 4, 5.  
Jones (1904), 2 to 8.  
Progressive Road (1913), 3.  
Riverside (1911), 7, 8.  
Standard Classics, 1.  
Stepping Stones (1897), 4 to 8.  
Wide Awake (1908), 2, 3.

These textbooks are not necessarily the most widely used nor the best books. They were chosen because they were available for the investigation and are probably fairly representative of current and recent books.

The analysis was made by classifying all of the material in each book into seventeen classes as indicated in the table. At the same time, the number of pages devoted to each class of material and the percentage of these pages to the total number of pages in each book was calculated.

The classification of the content material here adopted is very similar to that used by Woody<sup>2</sup> in his study of second-grade readers. The chief difference consists in combining all material relating to animals, such as pets, fowls, birds, and insects, into one class and in adding some additional topics, such as classics, adventure, geography and travel, which are either absent or very insignificant in second-grade books but which occupy considerable space in upper-grade books.

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<sup>2</sup> Woody, C. "The Overlapping in the Content of Fifteen Second Readers." *Journal of Educational Research*, II, 1920, 465-474.

RESULTS

Table 1 gives a summary of the results of the classification of the material. The content of each reader was analyzed and the percentage of the number of pages devoted to each type of material was computed. The numbers in the table are average percentages of the ten readers used in each grade. Thus the table states that the ten first-grade readers devote 28.8 percent of their pages to "animals," 16.8 percent to "boys and girls," 15.4 percent to "folklore," etc.

TABLE 1  
AVERAGE PERCENTAGE OF EACH CLASS OF MATERIAL IN THE TEN READERS  
OF EACH GRADE

Class of Content	Grade							
	I	II	III	IV	V	VI	VII	VIII
Animals . . . . .	28.8	21.5	10.0	9.2	7.9	3.6	1.3	2.5
Boys and Girls . . . . .	16.8	13.5	13.1	10.5	9.6	5.8	1.4	0.0
Folklore . . . . .	15.4	13.3	2.1	1.7	4.1	0.1	0.7	1.2
Fables . . . . .	3.4	5.4	8.4	2.7	0.4	0.1	1.4	0.0
Plants . . . . .	5.8	4.1	7.1	0.5	0.4	1.7	0.0	0.2
Elements (Wind, Water, etc.) . . . . .	2.4	1.2	4.7	1.3	0.4	1.0	6.2	1.4
Fairy Tales . . . . .	1.9	13.3	15.4	12.4	4.1	1.8	3.5	0.0
Plays and Games . . . . .	1.9	0.1	2.7	0.3	0.7	1.6	2.0	0.0
Classics . . . . .	0.7	0.5	2.2	10.7	15.3	24.4	3.2	34.1
Geography and Travel . . . . .	0.6	0.1	4.6	1.9	3.0	4.7	5.3	3.3
History and Patriotism . . . . .	0.3	1.0	10.1	7.0	12.4	17.4	20.4	9.8
Myths . . . . .	0.0	0.0	0.3	5.7	1.2	0.1	1.2	0.5
Conduct (Manners) . . . . .	0.0	0.2	1.2	7.2	0.5	4.1	0.4	2.0
Biography . . . . .	0.0	2.1	1.1	4.5	2.5	2.7	5.2	9.4
Adventure . . . . .	0.0	0.0	1.2	2.1	9.4	1.2	11.7	1.5
Poetry . . . . .	15.4	17.4	13.4	15.5	21.3	26.5	25.8	28.4
Miscellaneous . . . . .	6.7	0.8	2.2	6.0	6.4	2.5	9.2	4.4

It is evident that the contents of the lower-grade readers are very different from that of the upper-grade books. Aside from poetry, the three leading classes in the first grade are "animals," "boys and girls," and "folklore." These three groups, together with poetry, constitute over three-fourths (76.4 percent) of all the material. On the other hand, the four chief classes in the eighth grade are "classics," "history and patriotism," "biography," and "poetry." These four groups constitute over four-fifths (81.7 percent) of all the material, aside from poetry.

The three leading classes in the first grade gradually drop off from grade to grade to almost zero in the eighth grade. The leading classes in the eighth grade begin with practically no space in

the first grade and gradually increase to the maximum in the seventh and eighth grades. Poetry begins as a large item in the first grade and increases steadily up to the eighth grade to substantially double its space in the first grade. These points become clearer in the graphs of Fig. 1.

Two classes of material, namely "fables" and "fairy tales," occupy a slightly larger place in the intermediate grades than in

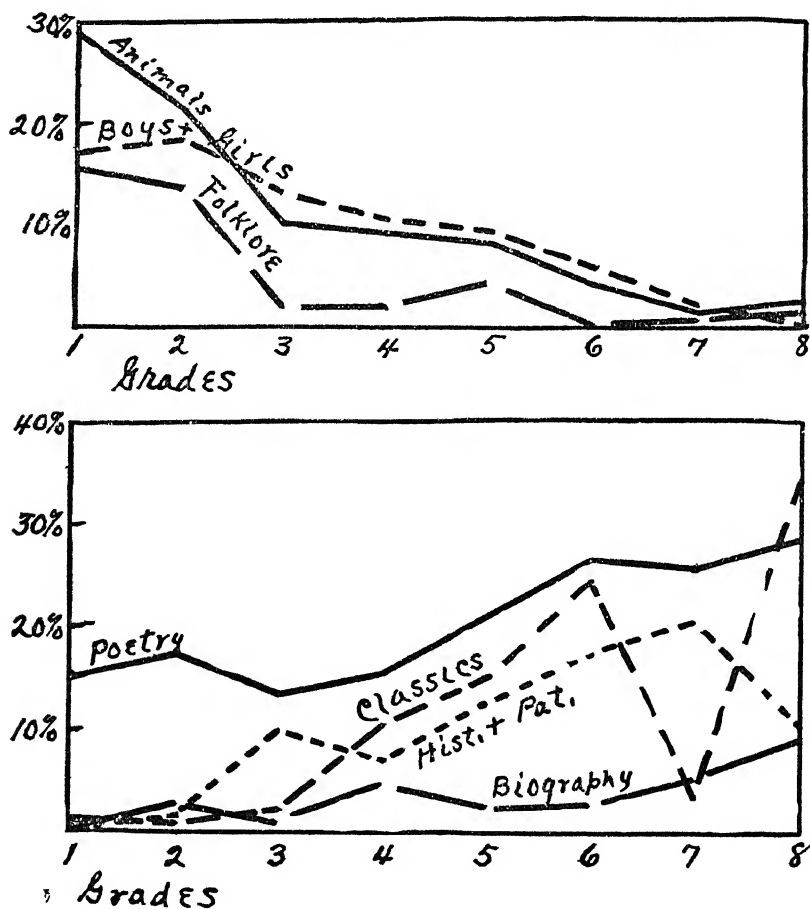


Fig. 1. Alterations in the Amount, in the Readers of Various Grades, of the Three Leading Classes of Content in the First Grade and the Four Leading Classes of Content in the Eighth Grade.

either the lower or higher grades. "Adventure" has its largest share in grades five to seven. All the other classes occupy very small space in practically all grades.

The reliability of these figures obviously depends to some extent upon the judgment of the persons analyzing the material. The lines of division between the various classes cannot be clearly drawn in every case. However, the fundamental facts are probably represented fairly accurately.

It is interesting to note, in the next place, the wide range of difference in the proportion of the various classes of material in the various readers for a given grade. The table for all readers in all grades here analyzed would be too long to reproduce. The table for the fourth grade, here reproduced as Table 2, is typical.

TABLE 2  
PERCENTAGE OF EACH CLASS OF MATERIAL IN EACH BOOK (FOURTH GRADE)

	Blodgett	Baldwin and Bender	Elson	Jones	Carroll and Brooks	Horace Mann	Brooks	Graded Literature	Stepping Stones	Golden Path	Range
Animals . . . . .	0.1	13.5	6.6	11.1	19.5	14.8	8.4	1.7	6.1	0.0	0.0 -19.5
Boys and Girls . . . . .	30.8	22.0	6.8	1.4	15.2	0.0	15.5	11.2	1.4	0.0	0.0 -30.8
Folklore . . . . .	2.2	3.6	0.0	0.0	3.4	0.0	7.3	0.0	0.0	0.0	0.0 - 7.5
Fables . . . . .	0.0	2.9	0.0	0.0	0.0	5.2	4.5	0.0	0.0	14.2	0.0 -14.2
Plants . . . . .	0.0	0.0	1.6	0.0	0.0	0.0	2.9	0.0	0.0	0.0	0.0 - 2.9
Elements . . . . .	7.1	1.6	4.2	0.0	4.9	0.0	0.0	0.0	0.0	0.0	0.0 - 7.1
Fairy Tales . . . . .	7.4	7.1	13.9	8.1	14.2	0.0	13.6	27.8	19.9	14.1	0.0 -27.8
Plays and Games . . . . .	0.0	0.0	0.0	0.0	1.3	0.0	1.8	0.0	0.0	0.0	0.0 - 1.8
Classics . . . . .	41.3	1.3	7.5	18.5	3.4	12.9	0.4	4.3	9.7	7.4	0.4 -41.3
Geography and Travel . . . . .	0.0	0.0	0.0	3.1	5.7	1.3	1.5	6.2	0.7	0.0	0.0 - 6.2
History and Patriotism . . . . .	2.5	9.0	24.6	1.4	2.2	8.1	2.9	4.7	9.1	4.6	1.4 -24.6
Myths . . . . .	1.3	0.0	0.0	4.1	8.9	6.5	10.6	7.2	6.6	12.6	0.0 -12.6
Conduct . . . . .	0.0	9.5	0.0	8.5	0.0	4.4	6.1	4.5	10.0	28.7	0.0 -28.7
Biography . . . . .	1.5	2.9	3.4	7.7	3.2	7.7	5.3	11.0	2.2	0.0	0.0 -11.0
Adventure . . . . .	0.0	0.0	8.3	3.3	0.0	9.7	0.0	0.0	0.0	0.0	0.0 - 9.7
Poetry . . . . .	8.0	22.6	17.5	15.5	8.5	12.7	18.7	16.5	26.9	18.3	0.0 -26.9
Miscellaneous . . . . .	0.0	3.6	5.5	15.9	9.4	3.5	5.1	4.5	7.1	5.0	0.0 -15.9

The range in amount of material of a given category is very wide. In other words, there is little uniformity among the different readers in the amount of space devoted to a given subject. For example, "classics" varies from 0.4 percent in one text to 41.3

percent in another; "fairy tales" range from zero to 27.8 percent, "history and patriotism" from 1.4 to 24.6 percent, etc.

The next problem was to determine the amount of specific material common to the readers for a given grade. Here, again, the complete table for all eight grades would be too long to reproduce here. Table 3 shows the data for the sixth grade.

TABLE 3  
SPECIFIC SELECTIONS, STORIES OR POEMS COMMON TO THE TEN SIXTH-GRADE READERS

	Elson	Jones	Heath	Carroll & Brooks	Golden Key	Stepping Stones	Blodgett	Baldwin & Bender	Graded Liter- ature Series	Brooks	Totals
Horatius at the Bridge.....	x	x	x		x	x				x	6
Chambered Nautilus.....		x	x				x				4
The Daffodils.....		x		x			x		x		4
Rip Van Winkle.....		x		x		x					3
Washington Irving.....	x						x				3
The Flag.....				x	x			x			3
To a Waterfowl.....		x	x						x		3
Pied Piper of Hamelin.....	x			x	x						3
Mr. Winkle on Skates.....									x		2
Miss Barker's Tea Party.....		x	x								2
A Voyage to Lilliput.....		x							x		2
Christmas at the Cratchets.....								x	x		2
Little Daffydawndilly.....	x				x						2
Ralph W. Emerson.....	x		x								2
James R. Lowell.....	x		x								2
Lexington.....	x				x						2
Hail Columbia.....	x					x					2
Arnold Winkleried.....	x					x					2
Sir Galahad.....				x					x		2
Rime of the Ancient Mariner.....		x	x								2
Abou Ben Adhem.....	x				x						2
Dying in Harness.....	x									x	2
Lochinvar.....				x		x					2
For A' That and A' That.....					x	x					2
The Humblebee.....				x			x				2
The Rhodria.....		x							x		2

This table is typical of the amount of overlapping of the various readers. One poem was found in six of the ten readers. Two selections were in four readers, five in three readers and eighteen in two readers. All the other selections appeared in one reader only.

#### SUMMARY

1. Four classes of material—"animals," "boys and girls," "folklore," and "poetry"—constitute three-fourths of the content of lower-grade readers.

2. Likewise, four classes of material—"classics," "history and patriotism," "biography," and "poetry"—constitute four-fifths of the content of upper-grade readers.

3. The differences in relative proportions of the various classes of material in the readers for a given grade are very great. There is no approximation to an accepted amount of material of a given class which authors agree should be in a book. For example, the division of "boys and girls," which constitutes one of the chief items in the fourth grade, varies from no space in one reader to over thirty percent of the space in another. If material of certain types is more interesting or appropriate or valuable than material of other types, then there ought to be greater uniformity in the proportions of the different classes of content.

4. The amount of specific content, such as selections, stories, poems, etc., common to three or more of ten books for a given grade is very small.



## SECTION 2

### EXERCISES FOR DEVELOPING ABILITY IN SILENT READING

It is the object in this section of the Yearbook on Silent Reading to present a few only of the many interesting practical exercises that have been actually employed in the classroom to develop skill in reading.

The contribution from Miss Heller and Mr. Courtis recounts efforts made at Detroit to train primary-grade pupils and embodies also suggestions for a simple scale of reading ability.

The contributions from Denver, Cedar Rapids, Racine, and Iowa City, being less elaborate, have been assembled in one group.

Readers who find the material of Section 2 of interest will get further suggestions from the first report of the Society's Committee on New Materials of Instruction, which was published as the *Nineteenth Yearbook, Part I*. Chapters I and II are particularly pertinent.

# I

## EXERCISES DEVELOPED AT DETROIT FOR MAKING READING FUNCTION

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REGINIA R. HELLER and S. A. COURTIS  
Detroit Public Schools

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### THE PURPOSES OF PRIMARY READING

Reading is carried on primarily for the purpose of controlling behavior. A citizen reads the campaign statements of the various candidates in order to cast his vote intelligently, or the advertisements in his daily paper to find out where to go to buy the articles he desires. To be sure, in poetry and other forms of artistic expression, aesthetic appreciation seems at first sight far removed from action; but in the last analysis, all reading of whatever type or kind modifies the behavior of the reader.

In attempting to train children to read, schoolmen have usually made the mistake of beginning with the type of reading whose effect is most difficult to trace; namely, reading involving aesthetic appreciation. The coming of exact measurement, however, has revealed the inefficiency of past training and led to a desire for lesson material which shall both emphasize the need for comprehension of what is read and furnish the teacher a measure of the success or failure of the child to comprehend.

The belief is steadily growing that a large part of children's reading in the early grades should be reading for a more direct and simple purpose than interest or appreciation; that, important as these elements are, they themselves must be considered as the direct products of comprehension of meaning, and that all meaning comes from experience, action. The first reading a child does must, from this point of view, serve in a direct and easily recognized way to modify or guide the child's behavior. To read incorrectly must be seen by the child to result in defective action. To know one has

read correctly must give immediate satisfaction, and in case of failure one must be able to tell for oneself whether or not the fault lies in the reading. Self-directed, purposeful reading of directions that call for action satisfies these requirements when a group of children are able to compare the objective consequences of their actions with objective standards and to determine themselves the causes of their differences.

Of the various types of reactions employed to improve the ability to comprehend what is read, drawing, cutting, and construction work were especially stressed for some months last year in the primary grades of the Detroit schools.

The children's natural love for drawing and the desire to produce a picture, furnished a motive for careful reading. To take advantage of this interest a series of exercises were planned, the products of which gave the child and the teacher objective evidence of the accuracy and efficiency with which the pupil read.

#### EXERCISES IN READING

At the outset types of exercises such as the following were used with first-grade children. The selections were written on the board and the teacher directed the children to read silently, then draw a picture or make a cutting to illustrate what they had read.

Up in the tree  
A little bird sings,  
Under the tree  
A little girl swings.

The Easter Bunny is sitting in the grass.  
He has a new spring coat as white as snow.  
He has beautiful pink eyes.  
He is carrying a basket of Easter eggs  
for the children.

For the second grade a variety of exercises were given in which the directions to draw or cut were included as part of the reading. A sufficient number of exercises were printed to supply each child with a different selection. In this way the child remained uninfluenced by the work of his neighbor.

The examples listed below show eight different types of the exercises used:

1. Directions for Illustrating Nursery Rhymes

- (a) "There was an old woman who lived in a shoe,  
She had so many children she didn't know what to do."

Cut out a large shoe.

Put a little window in the shoe.

Color the shoe black.

Cut out six children.

Make two of the children peeking over the top of the shoe.

Make three children peeking out of the window.

Make one child peeking over the toe.

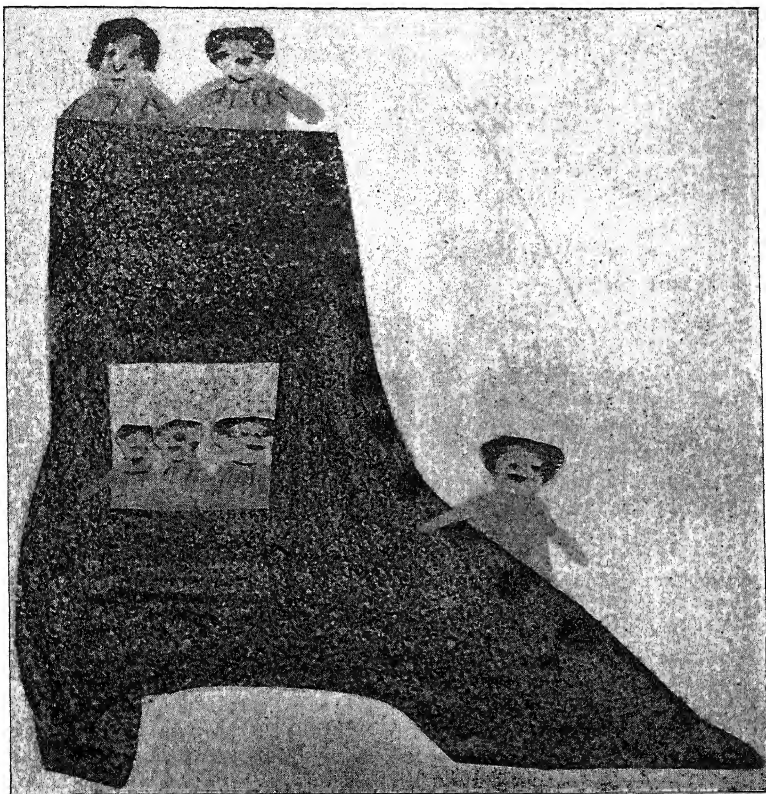


FIG. 1. ILLUSTRATION BY A SECOND-GRADE PUPIL, AFTER READING THE DIRECTIONS IN 1a.

- (b) *"Little Miss Muffett sat on a tuffet,  
Eating her curds and whey,  
Along came a spider and sat down beside her,  
And frightened Miss Muffett away."*

Make two pictures of this rhyme.  
In the first, draw Miss Muffett sitting on a tuffet.  
Draw her bowl of curds and whey.  
Draw a spoon in her hand.  
In the second picture, draw a big spider.  
Make him black with yellow stripes.  
Put six legs on him.  
Draw Miss Muffett running away.  
Draw her bowl fallen to the ground.

- (c) *"Hickory, dickory, dock,  
The mouse ran up the clock,  
The clock struck one,  
The mouse ran down,  
Hickory, dickory, dock."*

Draw a big clock.  
On the face put the numbers from one to twelve.  
Draw the big hand at twelve.  
Draw the little hand at one.  
Draw a pendulum hanging down from the clock.  
Draw the mouse running down the clock.

## 2. Directions for Illustrating Stories

Read over the story—

- (a) *"The North Wind at Play."*  
in Elson One, page 100.

Draw the apple tree before the North Wind came.  
Draw it after the North Wind had come.  
Draw the corn field before the North Wind came.  
Draw it after the North Wind had come.  
Draw the little white lily before the North Wind came.  
Draw it after the North Wind had come.

- (b) *"The Three Little Pigs."*

Draw the pigs' house.  
Draw the mother pig at the door.  
Make the three little pigs going away.  
Draw the first little pig when he met the man with some straw.  
Draw the house of straw.  
Make the pig looking out of the window.  
Draw the wolf at the door.  
Draw the second little pig when he met the man with the wood.  
Draw the house of wood.  
Make the pig looking out of the window.  
Draw the wolf at the door.

## 3. Directions for Constructing Toys

## (a) "How to Make A-B-C Blocks."

Fold your paper into sixteen squares.  
Cut off one row of squares.  
Make three cuts on each side like this:  
In square one, print a capital A.  
In square three, print a small a.  
In square two draw a picture of an apple.  
In square four draw a picture of an acorn.  
Fold like a box and paste.

## (b) "How to Make a Red-Riding-Hood Doll."

Cut out a little girl doll.  
Paste it on cardboard.  
Make a little red hood.  
Paste it on your doll.  
Make a little red cape.  
Paste the cape on your doll, too.  
Cut a basket and color it brown.  
Put it on your doll's arm.

## 4. Directions for Illustrating Social Studies

## (a) "Wash Day"

We shall hang out our washing today.  
Draw a clothes line across the top of your brown paper.  
Cut out a towel and paste it on the line.  
Cut out a pair of stockings.  
Hang them on the line, too.  
Cut out a shirt and paste it on the line.  
Cut out a little dress.  
Paste it on the line.

## (b) "Gardening Tools"

Fold your paper into four squares.  
Cut out a watering-can.  
Paste it in the first square.  
Cut out a rake.  
Paste it in the third square.  
Cut out a shovel.  
Paste it in the second square.  
Cut out a hoe.  
Paste it in the fourth square.

## (c) "Objects for an Indian Sand Table: an Indian Wigwam"

Get three sticks about six inches long. Tie them together at the top with string. Spread them out at the bottom so they will stand. This will make the framework of the wigwam.

Take a piece of brown paper nine by twelve inches. Cut a half circle from it. Make it as large as you can. This is the skin covering for your wigwam. Draw some Indian pictures on the skin. Fasten the skin covering around the frame work. Fold back the flaps for a door.

## (d) "An Indian Brave"

You will need a clothespin, some clay, some bright colored cloth and some small feathers.

Make a ball of clay over the head of the clothespin. Put in the eyes and nose and mouth. Try to make it look like an Indian face. Put two feathers in the top of the head. Make a square block of clay and press the bottom of the clothespin in it so the Indian will stand. Make a blanket of the bright colored cloth and sew it on your Indian. When dry, paint the Indian's face reddish brown. Paint his eyes and hair black. Make an Indian squaw in the same way, but do not put any feathers in her hair.

## 5. Directions for Drawing, Picking out a Portion of the Text, and Writing it in a Specified Place

## (a) "The Three Little Kittens"

"The three little kittens washed their mittens,  
And hung them out to dry.  
'Oh! mother dear, look here, look here,  
See! we have washed our mittens.'"

Draw two clothespoles and color them black.

Draw the clothes line between them.

Draw the three pairs of mittens on the line.

Draw the mother cat and the three little kittens standing near.

Under your picture write just what the little kittens are saying to their mother.

## (b) "The Bluebird"

(This exercise is complicated by requiring the children to search for an appropriate selection in their readers.)

Draw a branch of an apple tree.

Draw some little pink blossoms and green leaves on it.

Draw a bluebird perched on the branch.

Make his cap deep blue.

Make his vest a reddish brown.

Make his coat and tail deep blue.

Make his bill and feet dark brown.

Make his eye black.

Look for a bluebird poem in your book.

Copy one stanza of it on your spelling paper.

Put your picture and your poem together to make a little book.

## 6. Type Demanding the Reading of a Short Description to Carry Out the Directions

## "The Goldfinch"

In the summer, father goldfinch wears a bright lemon-yellow suit. He has a black cap, black wings, and a black tail. His little wife's dress is a dull green or olive yellow.

Mr. and Mrs. Goldfinch build a tiny little nest shaped like a cup. It is made of fine grass and moss. They are very fond of thistles and dandelions for they can line their nests with the fluff from these little weeds. Then they can eat the seeds for their dinner.

Draw a father goldfinch.

Make him perch on the branch of a little thorn bush.

Color his feathers to show the way he looks in the summer time.

In the crotch of the thorn bush, draw his nest.

Under the thorn bush, draw two weeds that he is very fond of.

Under your picture write a title for the drawing.

There are many possibilities of developing lessons of increasing difficulty along these lines.

7. Type Based upon Geography for Fourth-Grade Children and Necessitating Accurate Placing of the Drawing

Trace a map of the United States.

Put a star on the place where the greatest lake port in the world is located.

Color brown that part of Michigan in which copper is found.

Draw a ship at the greatest lake port in the west.

Draw a bale of cotton at the largest cotton port in the world.

Draw a mill in the greatest milling center of the world.

Draw some fish in the river from which we obtain great quantities of salmon.

Color blue the longest river in the world.

Draw an automobile at the place in Michigan where most automobiles are manufactured.

Draw a tree in the state in which the largest trees in the world are found.

8. Illustrating the Compositions of Other Children and a Sample Scale of Reading Ability

Third-grade and fourth-grade children enjoyed illustrating each other's compositions. Original riddles or stories were exchanged. The child receiving the composition, after reading it thoughtfully, illustrated the ideas. The papers were then returned to the writers, who, knowing the number of ideas they sought to express, were able to check the efficiency of the other child's reading, as shown by his illustration. Whether or no the reader gleaned all the ideas depended upon his ability to get the thought, and the ability of the writer to express his thought clearly. The following is typical:

"One day I was playing with another boy in some weeds. A snake ran in front of me. We each took a club and killed it."

The examination of the results from each class disclosed very definitely the number of ideas which were gleaned by the young readers. While some readers represented every idea, there were others who could represent only a few or perhaps just one of them. For example, in the directions, which are given below, for making the pot of tulips, some drawings showed that the reader had not understood how many tulips were to be drawn, that both buds and flowers were to be shown, or that small leaves as well as large leaves were to be made.

Cut out a flower pot.

Color it brown.

Cut out four tulips.

Make two look like buds.

Make two wide open.

Color them yellow.

Make some green leaves, big ones and little ones.

Paste them in the flower pot.

Put a back on the flower pot so that it will stand.



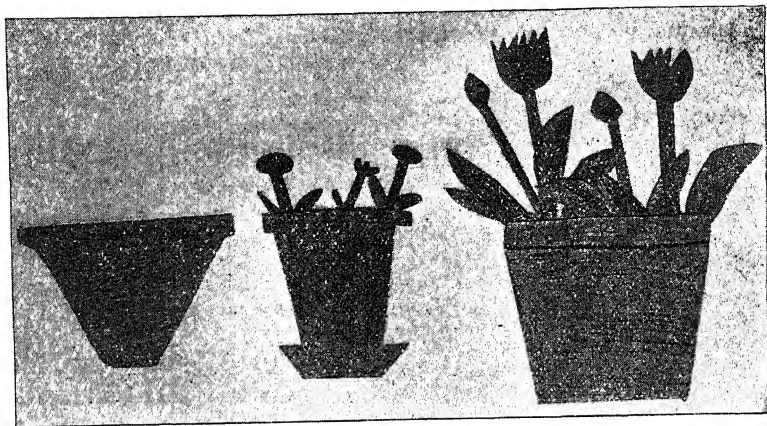


FIG. 2. THE POOREST, THE AVERAGE, AND THE BEST POT OF TULIPS  
PRODUCED BY THE CLASS

#### A SCALE OF READING ABILITY

A study of these results suggested the possibility of constructing a scale to measure the development from the first through the fourth grades of the ability to read silently and reproduce the ideas through drawing. It was also expected that these results would throw some light on problems in free-hand drawing.

The following scale was constructed and administered by the primary supervisors throughout the first four grades in five representative schools:

Draw a bird house.

Make it blue.

Put it in the top of a little tree.

Make a bluebird flying over the bird house.

Make another bluebird standing on top of the bird house.

Put a little red worm in his mouth.

The bird house is in a garden so draw a round flower bed near the bird house.

Draw some yellow tulips in the middle of the bed and some red tulips around the outside.

Draw some low bushes with red blossoms on them in the garden, too.

Now think of a name for your picture and print it with black crayon at the top of your paper.

Draw a little square in the lower left-hand corner of your paper.

In the upper half of this square print the initial of your first name in green.

In the lower half of the square print the initial of your last name in brown.

The scale gradually increases in difficulty; the first directions are simple enough in vocabulary, sentence structure, and thought for first-grade children to understand. It was intended that the last directions be difficult enough to tax the ability of fourth-grade children. When administered, it was found that only 36 percent of them were able to reproduce all of the forty-four ideas or items it contains.

The benefits derived from exercises of the type indicated seemed to be very marked, not only from the point of the development of reading ability, but in terms of those other educational products of even greater importance, self-direction, self-appraisal, self-control. As the work was wholly experimental, no exact measurement of results was attempted.

During the coming year, however, the experiment will be continued and an effort made to construct formal tests and scales which may be used to furnish exact measures of the effect of this type of training.

## II

### SILENT READING EXERCISES DEVELOPED AT DENVER, CEDAR RAPIDS, RACINE, AND IOWA CITY

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Comprehension is for the most part insured by the very nature of the responses to such exercises as follow. The teacher must guard, however, against mere formalized responses. Exercises which require every child to respond each time a card is 'flashed' are superior from the standpoint of class administration. For example, the entire class may react in concert to the card—"Point to the north." The teacher can easily detect any pupil who does not carry out such directions accurately.

#### I. THREE SILENT READING DEVICES FROM DENVER, COLORADO

(Reported by Helen R. Gumlick, Colfax School)

The questions or sentences are printed upon strips of heavy manila paper, 4½ inches wide and as long as necessary. The type used makes the small letters 1 inch high and the capitals 1½ inches high. The ink is black. The words can easily be seen from any part of the room.

The questions are flashed before the child. He does not say what is on the card but gives an oral answer to what appears there. The exercises have been used in 1A and 2B.

##### 1. Silent Reading Exercise Based upon the Flag

- Card 1. Whose flag is this? Child's oral answer, "Ours."
- Card 2. For what country does it stand? Child's oral answer, "The United States."
- Card 3. How many colors? Child's answer, "Three."
- Card 4. What is the blue for?
- Card 5. What is the red for?
- Card 6. What is the white for?
- Card 7. How many stripes?
- Card 8. How many red stripes?
- Card 9. How many white stripes?
- Card 10. What do the stripes represent?
- Card 11. How many stars?
- Card 12. What do the stars represent?

- Card 13. Who made the first flag?  
 Card 14. Who asked her to make it?  
 Card 15. What is another name for our flag?

### 2. Silent Reading Device Based upon Local Directions

- Card 1. Point to the north.  
 Card 2. Point to the south.  
 Card 3. Show me the east.  
 Card 4. Show me the west.  
 Card 5. Stand in the northeast corner.  
 Card 6. Go to the northwest corner.  
 Card 7. Name something on the east wall.  
 Card 8. What part of Denver is this?  
 Card 9. What is the main street on this side of the city?  
 Card 10. On what street is our school?  
 Card 11. How many blocks is Byers School from Broadway?  
 Card 12. Name three streets east of Broadway.  
 Card 13. Name three streets west of Byers School.  
 Card 14. Which direction from here do you live?  
 Card 15. Which direction from Broadway do you live?  
 Card 16. What direction do we go to get to town?

### 3. Silent Reading Device Based upon Table Etiquette

- Card 1. The plate belongs—— Child's oral answer, "Directly in front of you."  
 Card 2. The napkin belongs——  
 Card 3. The knife is placed——  
 Card 4. The fork is placed——  
 Card 5. The glass belongs——  
 Card 6. The host sits——  
 Card 7. The hostess sits——  
 Card 8. The guest of honor sits——  
 Card 9. Elbows are not——  
 Card 10. The knife is not put——  
 Card 11. Lips must not——  
 Card 12. Chairs must not be left in——  
 Card 13. Spoon must not be left in——  
 Card 14. Serve people to the——  
 Card 15. Remove dishes from the——  
 Card 16. If you wish something passed, say——  
 Card 17. If asked to have more, say——  
 Card 18. If you wish to leave the table, say——

## II. READING LESSONS BASED ON PROJECTS, FROM CEDAR RAPIDS, IOWA

The following lessons were developed by various teachers under the direction of *Miss Grace Shields, Primary Supervisor, Cedar Rapids, Iowa*. Lack of space prevents the printing of other similar exercises, which were uniformly excellent; the lessons given, however, are sufficiently representative. Other types of exercises based on the same material may be readily constructed.

There are two great advantages in this type of work. First, being based on actual experiences, they tend to guarantee more adequate comprehension on the part of the child. Second, they are based on factual material and accordingly may be carefully tested.

While these lessons may be regarded as primarily dealing with the development of comprehension, they involve also organization and remembrance. They could be made into speed exercises by having the pupils work under time pressure.

#### 1. "Making Tallow Candles"

(Reported by Ella Flynn, Grade II, Harrison School, Cedar Rapids, Iowa)

Subject—The Pilgrim home in America.

Problem—How was the Pilgrim home lighted at night?

Project—To make a tallow candle.

#### *Method of Approach*

Interesting phases of our November work brought about the discussion of the Pilgrim home in America. The children were interested in the primitive method of living, and especially in the process of candle making.

#### *Method of Procedure*

We procured a tin candle mold which would hold twelve candles. This mold was ten inches high. We purchased one ball of candle wicking and two pounds of tallow. The wicking was twisted and put through the molds double, being held in place at the top by a short stick. The tallow, sufficient for six candles, was then melted, poured into the molds, and allowed to cool until the next day. The mold was then immersed in warm water two or three times. The children pulled upward on the stick at the top of the mold and the candles were easily released.

The following day, one of these candles was placed in a candle stick and it burned readily. The candles will be used for our Christmas party.

The following questions may be duplicated in order that each child may have them before him, or they may be written on the blackboard or flashed on cards. The child's comprehension is indicated by his answers to the questions. Such exercises serve not only as lessons in reading, but also as an excellent type of review work.

#### *Questions to Be Used for Silent Reading*

1. What did the Pilgrims use for light?
2. Where did they get candles?
3. What did we use in making candles?
4. Where do we get tallow?
5. Why do we use a wick?
6. How did you place the wick in the mold?
7. What did you do next?
8. Of what use is the mold?
9. How long did you leave the candles in the mold?
10. How did we remove the candles from the mold?
11. How many candles did we make?
12. When are we going to use the candles?

## 2. "Drying Corn"

(Reported by Miss Byrd Snyder, Grade I, Taylor School, Cedar Rapids, Iowa)

The first step in this exercise was a discussion of the preparation of food for winter use. The second step was a project in drying corn. The project served as a basis for Lesson 1, which was developed with the pupils. The questions in Lesson 2 were read silently from the blackboard, and answered orally by the pupils.

*Lesson 1*

Miss Snyder brought some corn to school.  
It was sweet corn.  
We dried the sweet corn.  
First we took the husks and silk off.  
Sometimes there was a worm on the corn.  
We shook the worm in the waste basket.  
Then we cut the bad places out of the corn.  
We cut the corn from the cob.  
We found milk in the corn.  
We put the corn in the pans.  
We put the pans in the oven.  
It took two days to dry the corn.  
The corn is brown and hard when it is dry.  
We have put it into a bag until we have our Thanksgiving party.

*Lesson 2. Silent Reading*

1. Why did we dry the corn?
2. Could we have kept it any other way?
3. How did we get the corn ready for drying?
4. What did we sometimes find on the ears?
5. How did we dry this corn?
6. Could we dry it any other way?
7. How long did it take to dry it in the oven?
8. When shall we use it?

## 3. "Our Visit to the Fire Station"

(Reported by Miss Byrd Snyder, Grade I, Taylor School, Cedar Rapids, Iowa)

After a story and talk about fires and how they can be prevented, the following questions were given as a silent reading lesson.

1. What day is to-morrow?
2. Why do we have Fire Prevention Day?
3. Who helps us when we have a fire?
4. Who pays the firemen?
5. How do the firemen know when we need them?
6. Why do we have a fire drill at school?
7. How can boys and girls help prevent fire?
8. Tell some rules we should obey.
9. Would you like to visit a fire station to-morrow?

The following lesson was developed with the children as a summary of their trip.

*Our Visit to the Fire Station*

On "Fire Prevention Day" we went to the fire station.  
When we got there, the fireman invited us in.

We all went around on one side of the truck.  
We saw the tank of chemicals.  
They use chemicals whenever they can, instead of water.  
Water spoils the furniture.  
In the back of the truck we saw a big hose.  
Then the fireman showed us the engine.  
Laurence turned the crank and we heard the siren.  
Ruby rang the bell.  
These tell the people to get out of the way.  
While we were still looking at the truck, there was a real fire.  
After they had gone, we went outside a little while.  
Then we went upstairs and saw their boots and the beds where they sleep.  
Soon the firemen came back.  
The fire was out.  
Then the firemen let Paul and Albert go down the pole.

The following questions were given as a silent reading lesson after the visit to the fire station:

1. What did we see on the side of the truck?
2. Why do they use chemicals?
3. What did we see in the back of the truck?
4. Who turned the crank?
5. Who rang the bell?
6. Why did they have these?
7. What happened while we were looking at the engine?
8. Where do the firemen sleep?
9. Why do they stay at the station all night?

#### 4. "The Making of a Johnny Cake"

(Reported by Carolyn Pangburn and Lucile Pogge, Grade III,  
Cedar Rapids, Iowa)

##### *Problem and Project*

**Problem:** How did the early settlers prepare corn and use it for food?

**Discussion:**

- a. Where settlers first got the corn
- b. Indian method of growing corn
- c. Indians taught the settlers to plant corn
- d. How corn was cultivated
- e. Present day methods of milling
- f. Uses of corn as food

**Project:**

- a. Grinding or pounding corn into meal
- b. Making of corn bread

**Materials:**

- a. Mortar and pestle to pound corn into meal
- b. Corn, either white or yellow
- c. Materials for corn bread

**Method of Procedure:**

- a. Pupils shell corn
- b. Pupils place the corn in the mortar and, working in groups, pound corn into meal

- c. Pupils arrange a table with materials and utensils for making corn bread, using the following recipe:  
1 pint of corn meal  
 $\frac{1}{2}$  pint of flour  
1 teaspoon of salt  
2 tablespoons of molasses or sugar  
1 scant teaspoon of soda dissolved in a little hot water  
2 tablespoons of melted shortening  
2 eggs  
Sour milk enough to make a soft dough
- d. Mix, turn into greased baking pan  
e. Bake in moderate oven thirty minutes.  
f. Pupils eat corn bread for lunch

### *Silent Reading*

1. Did the early settlers know anything about corn before coming to America?
2. Where did they first find corn?
3. Who taught them how to use corn for food?
4. How did the Indian plant corn?
5. Why did the Indian put fish in each hill of corn?
6. How did the Indian use green corn?
7. How was corn prepared for meal?
8. What things were needed to make corn meal?
9. Is corn meal made in the same way to-day?
10. Of what use is corn meal to us?
11. Why is the germ removed from corn in making corn meal to-day?
12. Why is our meal better?
13. What materials are needed to make corn bread?
14. What utensils are needed?
15. How did the settlers bake their bread?
16. How long should corn bread be baked?
17. Why do we use less corn bread than the settlers did?

### 5. "Bird Observation"

(Reported by Miss Ella Flynn, Grade II, Harrison School, Cedar Rapids, Iowa)

Subject: Bird observation.

Problem: To provide shelter and protection for a bird.

Project: Building a bird house.

### *Method of Approach*

During the month of April we discussed the return of the birds from the south. The children reported from time to time the arrival of different birds. We became interested in the Junior Audubon Bird Club in which we might hold membership by paying an annual fee of ten cents. The object of this club is to attain a greater knowledge of our wild feathered friends and to protect them from being wantonly killed.

The Audubon Society furnished leaflets describing ten of the best-known Iowa birds, together with information about food, nests, and eggs and a small pocket guide for each child.

The children thought they could better observe and protect the birds by building bird houses and having the birds live near their homes.



*Suggestions Brought Out in Discussion*

1. The roof must extend beyond back of house for drain.
2. A small rest for the bird before entering house.
3. Sandpapering windows would prevent the birds' plumage being torn or lost.
4. The construction should be snug and secure, because it may serve as a home for some winter bird.
5. Perches were suggested.
6. Dimensions:

Pieces	Dimensions	Use
1	6 x 10	Bottom
2	4 x 8	Sides
2	4½ x 6	Ends
1	4 x 10	Roof
1	4½ x 10	Roof

*Procedure*

After considering the bird houses from the standpoint of comfort, the children constructed them. They were brought to school and the children told which were most practical for the different birds. The houses were then placed in trees or on posts near the homes of the children.

*Excursion*

One afternoon early in May we went to Ellis Park to observe the birds. We took with us our Junior Audubon pocket guides and checked the different birds observed. We also discovered a number of nests containing eggs.

Several phases of our bird work formed a language basis. Celia Thaxter's poem, "The Robin," took on an added meaning after the pupils had actually heard a robin singing during a spring shower.

*Questions for a Silent Reading Lesson*

1. What is the name of the bird club to which you belong?
2. What did you promise when you joined this club?
3. How did you think you could help the birds near your home?
4. What material did you use in your bird house?
5. How high and how long did you build it?
6. How many doors and windows has it?
7. What kind of roof does your bird house have?
8. Where did you place the house when finished?
9. What birds came to live in the home you built?
10. How do you think you have helped any bird this year?
11. How do you think the birds have helped us?

Reference: National Association of Audubon Societies, New York, N. Y.

## III. SILENT READING EXERCISES FROM RACINE, WISCONSIN

The following exercises were developed under the direction of Miss Myrtle Farnham, Supervisor, Racine, Wisconsin. Special credit for the pre-primer and first grade exercises is due to Miss Jessie Jensen, Lincoln School; Miss Christie Mainland, Knapp

*School; Miss Mayme Fahey, Miss Catherine Fahey, Washington School; Miss Alice Williams, Miss Vera Graham, Franklin School; Miss Ruth Reid, Fratt School; Miss Ellen Murphy, Winslow School.*

The practicability of each exercise has been assured by having it taught by a large number of teachers.

### A. The Kindergarten

Beginnings are made in the kindergarten which train the child to find out for himself the meanings of the printed or written word and to use ideas given in phrase, word, or sentence. Four illustrations are here presented.

#### 1. Assignments to 'Committees'

One problem centers about finding out who are to be the committees for the day or week. A card is illustrated by the teacher for the bulletin board which indicates by name who will look after the tables, chairs, plants, blocks, etc. Each child in the room is responsible for finding out whether he is on one of these committees and who are his associates in the work. That part of the bulletin board is a popular place, and much discussion over names and pictures takes place, together with good planning by the committees. The assignments are made by a card bearing pictures and the names of pupils, like this:

Table (Picture of table)	David Mary
Chair (Picture of chair)	Charles Harry
Sand table (Picture of sand table)	Lucile John
Cupboard (Picture of cupboard)	Helen Jennie
Floor (Line for floor)	Jack James

#### 2. Phrase Cards in Drawing Work

Giving parts of a story or ideas suggested by a phrase or a group of phrases in rapid drawing, we find, makes for concentration and quick interpretation. The phrase cards are distributed about the room. A number of children with their chairs, drawing boards, paper and pencil, move from one to another, illustrating rapidly. The teacher observes, suggests, corrects. Such phrases as *The big bear's chair, The little bear's chair, The middle-sized bear's chair, The big bowl, The middle-sized bowl, The big bed, The little bed, The middle-sized bed* are used with the story of "*The Three Bears*." At first the phrases are with the pictures, then they are taken away, one by one.

#### 3. Phrase Cards in Dramatization

In dramatization some stories lend themselves to the indications of characters or articles necessary by means of word or phrase cards, thus: *Garden,*

where the little red hen lived; *Santa Claus Land* or *A Christmas Store*, where the labels read "A Walking Doll," "A Talking Doll," "A Singing Doll." A Mother Goose Village carried many signs to be correctly interpreted in finding places and assuming characters for the dramatization; "Mary Contrary" must find her watering can and the places in the room designated "Garden" and "Flowerbeds." Jack and Jill must get their pail and find the place designated "Hill."

#### A. Labels in Games and Plays

Games and plays lend themselves to attaching meanings to printed words in one of the most natural and necessary forms: Goals are marked *One, Two, Three*, etc., and are called in races; Captains' names are placed on the black-board for score keeping; their companies' names are also placed there, and each child is held responsible for knowing in that way where his place is in the company.

#### B. Pre-Primer, Primer, and First Reader

Good silent reading habits were developed in connection with reading units based on nature study. The special subject was "Birds in the spring" (February to June). The problems in Nature study used as a basis were: "What do birds do in the world?" and "How may we attract them?"

In this work the following were some of the phases of development:

1. Observation and personal acquaintance with the birds; associated with near-by trees in gardens, yards, and fields.
2. Arrival and identification of a few for all of the class. This is not to be limited for those children who can learn of more.
3. Watching, recording, reporting and solving problems connected with the study of nesting and care of young.
4. Birds in picture, song, and story.

For pre-primer and primer classes words and phrases were quickly visualized to increase span of recognition. There was also silent reading in the class of individual record cards. The children read other cards than their own and told results of the other pupil's observations.

Three cardboards, each 6 by 9 inches, and ruled to answer the two questions "What?" and "When?" were given each child to take home the first of March and to be kept until they had a record of one bird on each card, then returned and used in silent reading in class work. At first, there were individual reports; then all were fastened to the bulletin board and grouped by the pupils through silent reading of content. This was worked out by groups. Through silent reading all of the reports on the robin were arranged together, all of those on the bluebird together, and so on. A study of food calendars followed this work. The home work, the class silent reading, the reproduction and the bulletin grouping were carried out as with the charts of arrival.

The charts of arrival and the food calendars were developed like these samples:

#### Chart of Arrival

What?	When?
Robin	March 8th
Woodpecker	March 9th
Wren	March 15th

*Food Calendar*

Food of Robins

Worms

Food of Hairy Woodpecker

Cocoons

Eggs of Beetles

The foregoing represent beginnings which were added to during the term.

We also use in silent reading descriptive cards of the birds. These are worked out with the teacher in class composition. After they are finished, one child holds the card for the class to read silently. Another child finds that picture of the bird on the bulletin board which answers the card description.

Cards 12 by 14 inches, like the following, were used:

I make a nest in the trees.

I make it of sticks

mud

dry grass.

I live in a bird house.

It is in a tree.

It is small.

The same idea is carried out in individual records contributed by children and written by the teacher on the blackboard. This is one illustration:

In the orchard there is a bird's nest.

It is a robin's nest.

Hectographed slips or printed slips, the content taken from primers and library books, are mounted on cardboard and are read silently to get information needed in carrying on the nature study work.

Two of the card lessons were derived as follows:

a. How to help the wrens.

b. How to help the robins.

(From "Little Kingdom Primer," by  
Sawyer. Publishers, Rand-McNally Co.)

c. Up to the sky.

(From "Character Building Series"  
Part I, Book I, by Kenyon and Werner.  
Publishers, Hinds, Noble, and Eldridge.)

#### IV. A LESSON TO TEST AND DEVELOP THE ABILITY TO COMPREHEND CERTAIN WORDS AND PHRASES

(Submitted by Emma Watkins, First-Grade Teacher, University  
Elementary School, State University of Iowa)

The calendar used for these exercises is of the ordinary sort distributed as advertising by commercial houses. It was mounted on a large sheet of cardboard in order to give the required stiffness. The words, phrases, and sentences were printed on pieces of cardboard, care being taken to print the entire phrase or sentence in one line. After seating the pupils as close to the calendar as convenient, the lesson is begun by telling the pupils that they are to be shown flash cards upon which are printed words which will tell them what to point

to on the calendar. Pupils are directed to stand as soon as they understand the meaning of the first phrase which is flashed. The pupil who finishes first is allowed to stand before the calendar and point to the appropriate place indicated by the flash card. This pupil continues the exercise, reading additional cards, until he makes an error, when his place is taken by some other pupil who can read that exercise. The lesson as described here is given under time pressure. It presupposes that the words and phrases which are used have been already developed with the class. The class is an advanced first-grade class.

### 1. Phrases

yesterday	the last day of the month
today	the first quarter of the moon
tomorrow	new moon
next week	full moon
this week	last quarter of the moon
the month	Sunday
the year	Monday
the date	Tuesday
week after next	Wednesday
a week from tomorrow	Thursday
two weeks from tomorrow	Friday
a week ago yesterday	Saturday
day after tomorrow	the day before the last day
day before yesterday	of the month
in two days	the sixteenth
the first day of the month	the fifteenth, etc.
the first day of the week	next Monday, etc.
next Saturday	next month
last Thursday, etc.	last Monday

### 2. Sentences

On what day do you go to Sunday-school?  
 What will be the last day of school this week?  
 (Other similar sentences.)

# Information Concerning the National Society for the Study of Education

1. **PURPOSE.** The purpose of the National Society is to promote the investigation and discussion of educational questions. To this end it holds an annual meeting and publishes a series of Yearbooks.

2. **ELIGIBILITY TO MEMBERSHIP.** Any person who is interested in receiving its publications may become a member upon application to the Secretary and subsequent approval by the Executive Committee. Membership may not be had by libraries or by institutions.

3. **PERIOD OF MEMBERSHIP.** Applicants for membership may not date their entrance back of the current calendar year, and all memberships terminate automatically on December 31st, unless the dues for the ensuing year are paid as indicated in Item 6.

4. **CLASSES OF MEMBERS.** Application may be made for either active or associate membership. Active members pay two dollars dues annually, receive two copies of each publication, are entitled to vote, to hold office and to participate in discussion. Associate members pay one dollar dues annually, receive one copy of each publication, may attend the meetings of the Society, but may not vote, hold office or participate in discussion. The names of active members only are printed in Part I of each Yearbook. There were in 1920 about 250 active and 800 associate members.

5. **ELECTION FEE.** New active and new associate members are required the first year to pay, in addition to the dues, an election fee of one dollar.

6. **PAYMENT OF DUES.** Statements of dues are rendered in October for the following calendar year. By vote of the Society at the 1919 meeting, "any member so notified whose dues remain unpaid on January 1st, thereby loses his membership and can be reinstated only by paying the election fee of one dollar required of new members."

7. **DISTRIBUTION OF YEARBOOKS TO MEMBERS.** The Yearbooks, ready each February, will be mailed only to members whose dues for that year have been paid. Members who desire Yearbooks prior to the current year must purchase them directly from the publishers (see Item 8).

8. **COMMERCIAL SALES.** The distribution of all Yearbooks prior to the current year and also of those of the current year not regularly mailed to members in exchange for their dues is in the hands of the publishers, not of the secretary. For such commercial sales, communicate directly with the Public School Publishing Company, Bloomington, Illinois, who will gladly send a price list covering all the publications of this Society and of its predecessor, the National Herbart Society.

9. **YEARBOOKS.** The Yearbooks are issued in parts (usually two) every February. They comprise from 250 to 500 pages annually. Unusual effort has been made to make them on the one hand of immediate practical value and on the other hand representative of sound scholarship and scientific investigation. Many of them are the fruit of cooperative work by committees of the Society.

10. **MEETINGS.** The annual meeting, at which the Yearbooks are discussed, is held in February at the same time and place as the meeting of the Department of Superintendence of the National Education Association.

Applications for membership will be handled promptly at any time on receipt of name and address, together with check for the appropriate amount (\$3.00 for new active membership, \$2.00 for new associate membership).

GUY M. WHIPPLE, Secretary-Treasurer.

University of Michigan,  
Ann Arbor, Michigan.



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